The Builder.

VOL. XCIII.—No. 3367. AUGUST 17, 1907.

ILLUSTRATIONS.

Proposed Canadian Offices, Strand, London.....Messrs. A. Marshall Mackenzie & Son, Architects.

Sketches with the Architectural Association:—
Aylsham Church; Font, Walsingham Church; Oxborough Hall; Part of the Rectory, Great Snoring; Priors' Door, the Cloisters, Norwich Cathedral, etc. .....Sketches by Mr. W. Curtis Green.

Illustrations in Text.

Another Look at Letchworth:—
Fig. 1. Two Cottages by Mr. R. T. Heys Page 186
Fig. 2. Two Cottages by Mr. J. Howard Goodchild..... Page 187
Fig. 3. Two Cottages by Mr. Percy B. Houfton ..... Page 187
Fig. 4. Three Cottages by Messrs. Bennett & Bidwell..... Page 188

Mediæval Church Planning in England.—III:—
Fig. 17. Beverley Minster ..... Page 188
Fig. 18. Bristol Cathedral ..... Page 188
Fig. 19. Cartmel Priory ..... Page 188
Fig. 20. Rochester Cathedral (1200) ..... Page 188
Fig. 21. Waverley Abbey (1128)..... Page 189
Fig. 22. Bolton Priory ..... Page 189
Fig. 23. Norton Subcourse..... Page 189

The Architectural Association Excursion:—
Old House at Norwich ..... Page 191

Magazines and Reviews:—
Centre Building, Mannheim Jubilee Exhibition. Professor Billing, Architect ..... Page 193
Garden Pavilion, Mannheim Jubilee Exhibition. Professor Max Läuger, Architect... Page 194

Illustrations to Student's Column:—
Fig. 11. An Anti-vibrator and Factory Lamp Page 200
Fig. 12. Burner with Dust-protector ..... Page 200
Fig. 13. A Foundry Lighted with High-pressure Gas ..... Page 201
Fig. 14. A Pattern Shop with Anti-vibration Gas Fittings ..... Page 201
Fig. 15. A Tailor's Factory Lighted with High-pressure Inverted Burners ..... Page 202

CONTENTS.

	PAGE
Another Look at Letchworth	185
Mediæval Church Planning in England.—III.	188
Notes	189
The Architectural Association	191
Magazines and Reviews	192
International Congress on School Hygiene	194
Fifty Years Ago	196
Illustrations:—	
Proposed Canadian Offices, Strand	196
Sketches with the Architectural Association Excursion	196
International Housing Conference	198
Builders' and Contractors' Column	198
The Tribunal of Appeal	199
Architectural Societies	199
Archæological Societies	199
Competition	200
Books Received	200
Trade Catalogues	200
Correspondence:—	
The Flèche at Amiens	200
Priory of St. John at Clerkenwell	200
The Student's Column	200
Obituary	202
General Building News	202
Sanitary and Engineering News	203
Stained Glass and Decoration	203
Foreign	203
Miscellaneous	204
List of Competitions, Contracts, etc.	205
Patents	207
Some Recent Sales	208
Meeting	208
Prices Current	208
Tenders	209

Another Look at Letchworth.

AT the time of the first cottage exhibition at Letchworth Garden City we devoted a considerable space to a review of the numerous cottages erected in competition for the prizes offered for cottages capable of being built for 150*l.* each. We hardly thought that the problem had been really solved. There were cottages which could be built for that sum, but which seemed much more suitable for summer than for winter habitation. There were some of rather more solid character which had been built for that sum on the ground and for that special occasion, but which the builders were hardly prepared (as one of them very frankly told us) to carry out elsewhere at the same cost. The exhibition, however, was undoubtedly interesting and did something, if not all one could have wished, towards elucidating the subject of cheap cottages which should be picturesque in appearance. There was, however, too much attention bestowed on the picturesque and too little on the question of substantial structure. It is no good economy to put up cottages which look well at the outset but which will infallibly require repairs in a few years.

There has been another exhibition at Letchworth this year of cottages of a rather larger type, which was opened some two months ago. We did not attempt to deal with it at the opening, experience having shown that exhibitions of this kind are never complete on the opening day. Some of the houses, in fact, were not completed on the occasion of our visit a few days ago.

The new exhibition is comprised in a not very large irregular four-sided area bounded on three sides by Norton-way (one of the principal roads in the laying-out), the Leys, and Pixmore-way, and with a central road, "Middle-street," running through it, at present closed by gates at either end, during the continuance of the exhibition, to which a small entrance fee is charged. The houses, however, are obviously intended to form a portion of the permanent habitations of Garden City. They are defined in the Catalogue as "Urban Cottages," and are classed as follows:—

Class I.—Two bedrooms, living-room, and scullery, a third bedroom and parlour may be added. Total cost not to exceed 175*l.*

Class II.—Three bedrooms, parlour, kitchen with sink, and outside wash-house with copper. Total cost not to exceed 200*l.*

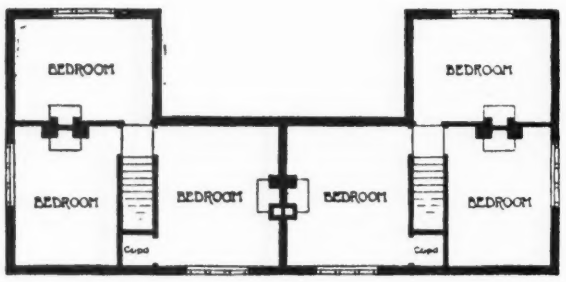
Class III.—Three bedrooms, parlour, kitchen, and scullery. Total cost not to exceed 240*l.*

Class IV.—Class for best artisan's cottage, not limited as to cost.

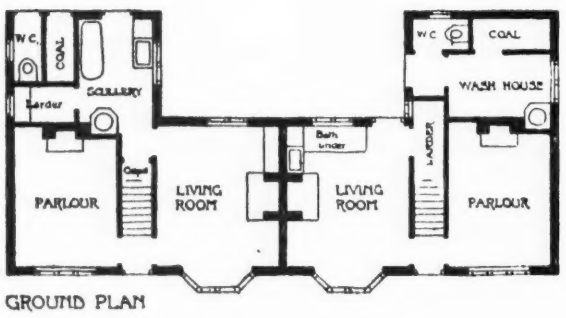
All cottages to contain larder with outside window, water-closet, and bath, and to have gas and water fittings ready for connexion, and drainage to main sewer provided. Height of rooms to be not less than 7 ft. 6 in.

The first in the Catalogue order is a block of six cottages, 211 to 216 (we presume the numbering starts where the former exhibition left off), designed by Mr. Crickmer for Miss A. J. Lawrence; four of them representing Class I., and two of them Class II. They are of 9 in. brick with cement roughcast, and sand-face tile roofing, and make a very picturesque block, but we notice at once the mistake which seems to run through nearly all the buildings here—the employment of high-pitched roofs and low walling. How much of this is economy and how much the desire to be picturesque one cannot say; but the result in most cases is that what might be good bedrooms as far as floor space is concerned have ceilings much cut up by roof-slopes and valley angles. In the two Class II. houses the kitchen range is badly lighted; the ground-floor plans of the other four are better. There is a want of cupboards in the bedrooms; in one plan a very narrow recess is made into a cupboard; the wider recess on the other side of the chimney-breast would have made a more useful one. These cottages, like all the others, have a small garden in front of each, with a simple wooden paling separating them from the road; in this case the gate-posts are carried up to form a door-like entry with a head over it, which is of no practical use and looks rather absurd. Nos. 217 and 218 (Messrs. Bennett & Bidwell, architects) form a small block with a hipped roof, containing two cottages of unequal size—Class I. and Class II.; walls also of brickwork roughcast. Here the bedroom ceilings are much less cut up, and the building as a whole is one of the best both in appearance and in practical arrangement.

Nos. 219-220, exhibited by Mr. R. T. Heys, and including two cottages of Classes III. and IV., is a very sensibly



BEDROOM PLAN



GROUND PLAN

Fig. 1. *Two Cottages by Mr. R. T. Heys* (*Nos.* 219, 220).

planned block with a comparatively low-pitched hipped roof over the whole (Fig. 1); the planning is very good; there are large cupboards arranged in connexion with the principal bedrooms; and this block, which is perfectly agreeable in appearance, shows how much more sensible is the employment of a low-pitched roof, instead of capping the cottages with the unpractical mass of high-pitched roof adopted as an element of the picturesque—for it has no other recommendation. Mr. E. A. Jeffs, builder, in the cottages 221 and 269 (Class IV.) has attempted, not unsuccessfully, a little more of architectural effect; his archway porch, with a bench on each side of it and a red tile label over the arch, is a nice feature, and there is no fault to find with the plan, which is very well arranged; the block is roofed with a single ridge and a gable at each end; a much better scheme than the crossing ridges and gables of Nos. 222-226 (Mr. H. C. Lander, architect), which cuts up the bedrooms very much; moreover they have no cupboards at all, and on the ground floor the entrance to the water-closet is inside the house, which in these very small houses should always be avoided.

Nos. 231-236 (Mr. Crickmer, architect) form a rather important group; they stand back with a green before them, and form the head of a kind of small *place* laid out at right angles to Middle-street, which crosses it. These are six cottages belonging to Classes I., II., and III.; the appearance of the small terrace, partly treated with wall tiling, is picturesque though rather too much cut up, and the bedrooms are good, with a pretty large cupboard space secured for the principal one in each tenement; but in four out of the six ground-plans the cooking range is in a dark recess quite away from direct light, which is most unpractical and inconvenient.

The block of two cottages (237, 239) by Messrs. Caley & Rochester, of Rothwell (Kettering), has much merit; both upper and lower plans are well arranged; if they had only kept the roof-springing a little higher, they would have avoided having a valley at the stair-head low enough to run one's head against; but the bedrooms themselves are commodious; and the cottage is all the better for avoiding the pretence at the picturesque which is the besetting sin at Letchworth. Another small block which merits praise is that exhibited by Mr. Howard Goodchild (architect), Nos. 248, 250 (Fig. 2). The bedrooms are good, and each has a fairly large cupboard. The following are the advantages claimed for these cottages, and they are fairly claimed:—

"Large accommodation in very small space, which, combined with simplicity of plan, and solidity of construction, make for cheapness and durability. The chimney-stacks are very economical, both of space and material. Doors have been kept well away from the fireplace, and the kitchen is private. Water-closet can be reached from bedrooms without disturbing the living rooms. Front door, stairs, and door to scullery can be screened off by a curtain in winter. The position of the kitchen flue helps to warm the three bedrooms through which it passes."

A larger pair 251, 253 (Mr. P. B. Houfton, architect) have the merit of simplicity both in plan and elevation, and a bath-room is got in off the stairs, as a kind of mezzanine. The same architect's pair, Nos. 254, 255, have somewhat similar merits: the small porch is well contrived; we give an illustration of this one (Fig. 3). In this case the bath is under the hinged dresser-table in the scullery. These two last-named blocks range along one side of the *place* before mentioned. Both these last belong to Classes III. and IV., representing the superior order of cottage dwelling. Opposite to them are three smaller cottages, Nos. 262 to 264, for "Letchworth Cottages and Buildings, Ltd." (Messrs. Bennett & Bidwell, architects); of these we also give an illustration (Fig. 4); they were only half-finished at the time of our visit, but the plan is a very good one, and the exterior view shows the advantage of a simple method of roofing and the avoidance of cutting up the roofs in the search for the picturesque. These belong to Class I. There is no scale to the plans.

The development of Garden City does not seem to proceed very fast, nor does it at present exhibit a very attractive appearance. It may on further development realise all that its promoters expected or promised, but we feel a little doubtful as to its future. And there is certainly one fault pervading nearly all the building; the effort after the picturesque combined with the neglect of solid and durable character in building. All these offers of prizes for cottages to be erected at an almost impossibly low cost have had the effect of establishing what one fears will become a kind of tradition of flimsy building. It threatens to be a town of thin walls and cheap work; and the obvious endeavour to be picturesque does not atone for this. We would rather see plainer but more solid building. The Howard Memorial Hall, built in commemoration of the wife of the originator of the idea of the Garden City, is one of the principal buildings yet erected, and is a design cut up into all kinds of angles and quirks in the effort to be picturesque. It was built, we read in the Catalogue, for 1,350*l.*, far too small a sum for substantial work in a building of that size. The same may be said of the Free Church Hall nearly opposite, a structure in the ultra-modern style of picturesque, with the sloping buttresses which one comes across everywhere now, run up for 300*l.*: to be sure, it is added that "this sum would have been much exceeded but for the amount of labour given voluntarily by enthusiastic Free Churchmen." We have not much faith in the future of a city started with the thinnest walls and the cheapest work that can be made to look well. There is yet time, perhaps, to amend this policy; there is not much of Garden City actually built yet; and we should advise a reversion to more solid standards of a building, and an avoidance of what may be called the picturesque pose—for it is a pose, to a great extent. In regard to the sewage

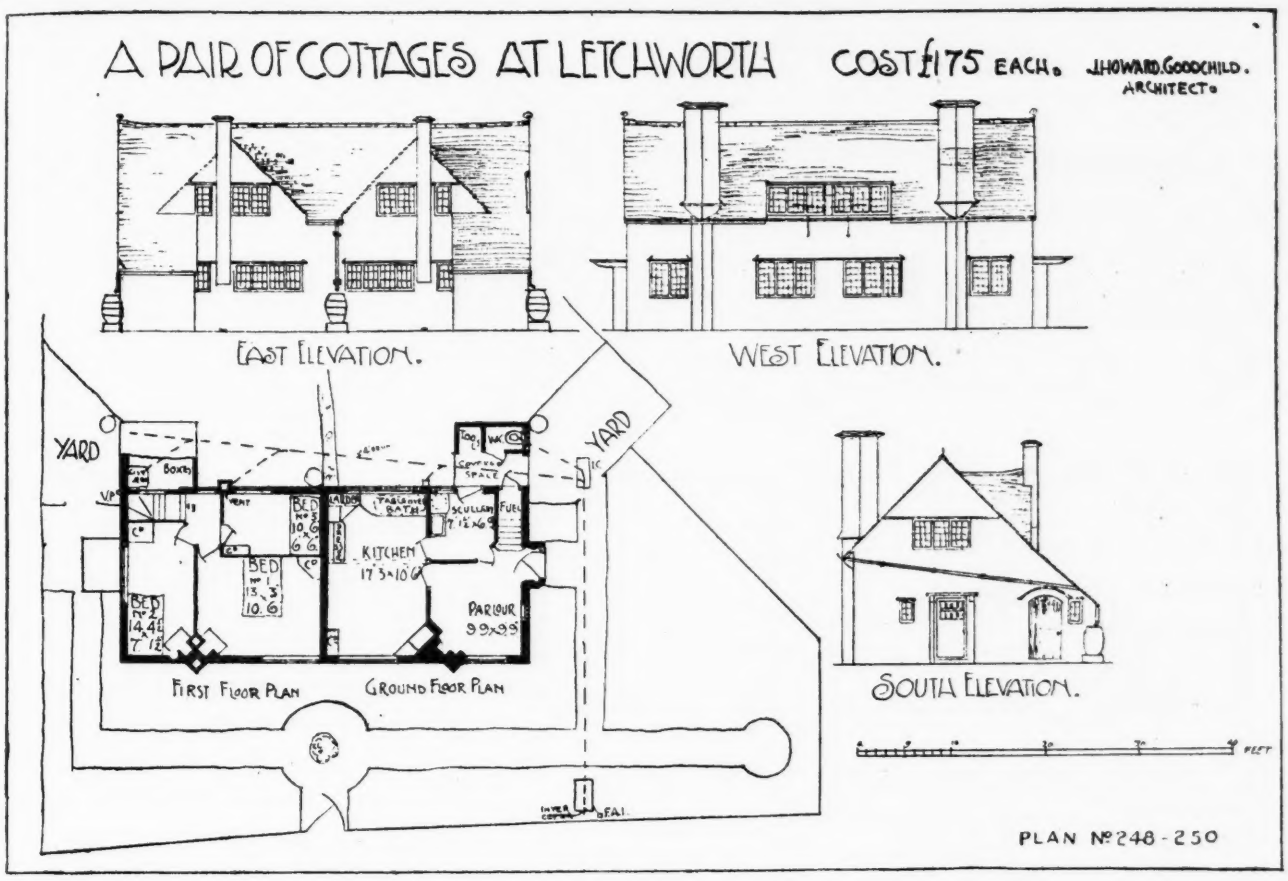


Fig. 2. Two Cottages by Mr. J. Howard Goodchild (*Nos.* 248, 250).

question the authorities have wisely decided for the ordinary system of water carriage :—

"As regards sewage disposal, much was to be said for the natural methods advocated by the late Dr. Poore; but experience has shown that this system, so admirable when carefully carried out, breaks down in large European communities, especially amongst the working classes, who have neither the experience, nor the spare time and energy, nor the will requisite for the purpose. To factories, moreover, a system of sewerage for trade waste is essential; and so sewerage was decided on. Sewers have been laid, virtually all houses have been connected up, and the sewage gravitates to a low-lying area on the west of the estate, where it is treated by broad irrigation."

The pail system or earth-closet system has always failed when applied to whole districts, though it may do very well for isolated dwellings; and the promoters have shown wisdom in this respect. A well sunk to the chalk has furnished a good water-supply.

An article on "Cottage Planning," by Mr. Raymond Unwin, which is included in the Catalogue volume, contains some very good remarks on the subject, especially in regard to the desirability of getting at least one good-sized room even in the smallest type of cottage, and not dividing up a small cottage into as many rooms as a larger one. His small diagrams as to the right and wrong way of placing doors in a room are useful.

The "Plans and Models" exhibition does not contain anything of much interest. Among the drawings we noticed a terrace of cottages projected by the Hendon Urban District Council, brick ground story with roughcast above, which seems to have some good features in the planning of Kitchen and Living Room and the placing of the "specially designed range." We also came across the elevations, with no plan, of a Convalescent Nurses' Home of which the perspective view, also without a plan, was exhibited at the Academy; evidently the author thinks that the plan of a Nurses' Convalescent Home is of no consequence. The Standard Range and Foundry Company exhibit in the inner room a really good collection of cheap but well-designed iron mantels. In the end room we caught sight of a rather bewildering pyramid of large stones, which turned out to be the advertisement of a firm

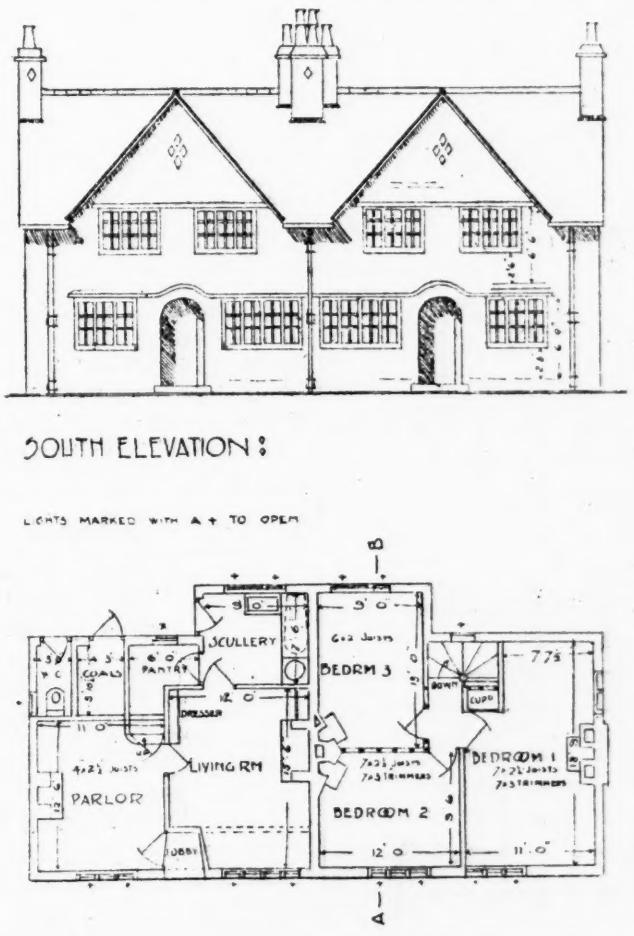


Fig. 3. Two Cottages by Mr. Percy B. Houfton (*Nos.* 254, 255).

O

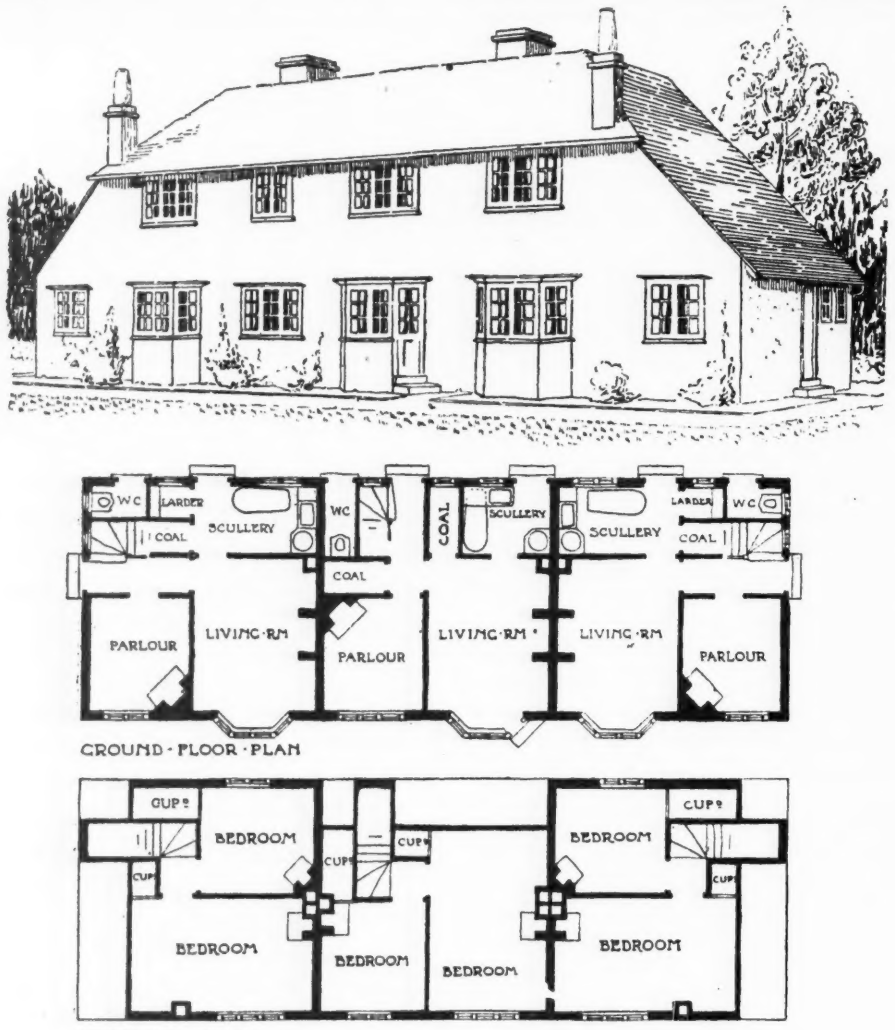


Fig. 4. Three Cottages by Messrs. Bennett & Bidwell (Nos. 262 to 264).

of landscape gardeners—the materials apparently for an artificial rockery. We trust the Garden City will escape landscape gardening, at all events. That would be the last straw.

MEDIÆVAL CHURCH PLANNING IN ENGLAND.—III.

By Francis Bond, Hon.A.R.I.B.A.

SEVENTH GROUP; type, Bristol Cathedral.—The fourth group of churches, of which Salisbury is a type, all had an ambulatory distinct from the three or more eastern chapels external to it. But where there were not funds for so much accommodation, the church had to be built on a reduced scale, with the lateral eastern chapels placed *inside* the ambulatory, not east of it. Of these the most magnificent is Beverley Minster (Fig. 17), as rebuilt *c.* 1235.

The following are the chief examples. None of them were originally cathedrals; Bristol and Manchester subsequently obtained cathedral rank:—

Beverley Minster—Secular canons—*c.* 1235.
Bristol Priory—Austin canons—1298–1341.
Ottery St. Mary—Secular canons—begun 1337.
Binham Priory—Benedictine monks—? XIVth century.
Christ Church, Hants—Benedictine monks—begun *c.* 1400.
Wenlock Priory—Cluniac monks—*c.* 1400.
Bristol, St. Mary Redcliffe—Parish church—*c.* 1470.
Malvern Priory—Benedictine monks—? *c.* 1450.
Manchester—Secular canons—? 1518–1535.

All the above have lateral aisles both to choir and presbytery. One bay west of the Lady Chapel is placed the high altar. The bay at the back of the high altar serves as processional aisle. It also serves to hold two altars, one at each end.

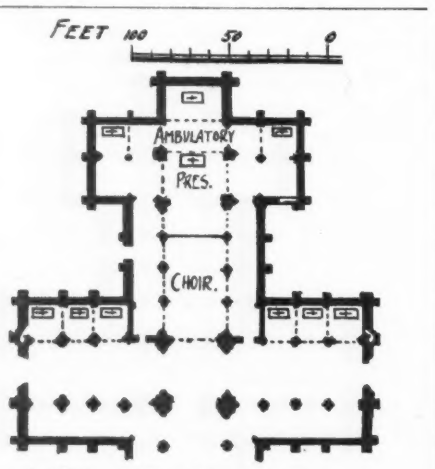


Fig. 17. Beverley Minster.

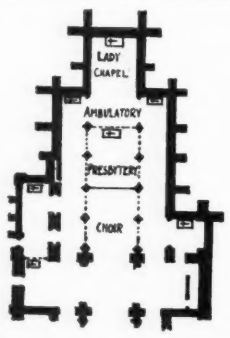


Fig. 18. Bristol Cathedral.

A serious defect in this plan is that a procession passing round the high altar is brought into undesirable proximity to the two lateral eastern altars. At Beverley this difficulty is cleverly disposed of by prolonging the ambulatory one bay to north and south, so as to give it five instead of the usual three bays. Of the five bays thus provided the three central form the processional aisle, while each end-bay forms a chapel.* In later days, *c.* 1489, another chapel was added, north of the central chapel; this also was clear of the processional path. It is one of the most compact and admirably arranged plans of the Middle Ages. At Beverley, as at Worcester, the central eastern chapel was only one bay deep, and a very considerable amount of eastern light must have been gained from tiers of lancets disposed as at Ely or Southwell. In both the lighting was still further improved at a later period by the conversion of these lancets into a single window occupving almost the whole eastern wall of the central eastern chapel. At Worcester modern lancets have recently replaced the large window, obliterating an important period in the history of the eastern limb.

Eighth group; type, Cartmel Priory.—The next group of churches is planned like the last, except that what was in those an unaisled Lady Chapel is now an unaisled presbytery. The eastern limb, therefore, consists of aisled choir and unaisled presbytery. Of this plan the special merit is that the presbytery receives direct light from north, east, and south at once.

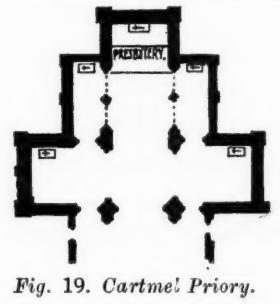


Fig. 19. Cartmel Priory.

Thus, in the present Rochester Cathedral (Fig. 20) the presbytery has in the ground-story four windows on the north side, three on the east, and four on the south; moreover, it has upper windows also to the number of eleven. Thus the high altar, which originally was placed in the centre of the Rochester presbytery, was admirably lighted.

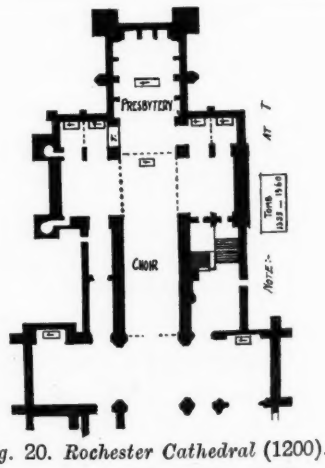


Fig. 20. Rochester Cathedral (1200).

But with such a presbytery processions and pilgrims could not pass round the

* Mr. Leach has recovered the dedication of these two chapels.

high altar, they must have passed in front, *e.g.*, at Rochester the processional aisle must have occupied one of the return aisles, not at the back, but in front of the presbytery. The fact that a presbytery without aisles was so well lighted may well have reconciled many to lessened processional convenience. At any rate, many important churches were built on this plan. The following is a list of the chief examples :—

Lastingham, Yorks.—Benedictine cell to Whitby—*c.* 1080. An aisled choir of three bays and an apsidal presbytery of one bay without aisles.
Oxford, St. Frideswide—Austin canons—1154–1180.
Lavercost—Austin canons—consecrated 1169.
Tynemouth Priory (cell of St. Alban's)—Benedictine monks—*c.* 1190 (Eastern Lady chapel added later).
Cartmel—Austin canons—after 1188.
Rochester cathedral—Benedictine monks—*c.* 1200.
Finchale Priory—Benedictine monks—*c.* 1200.
Cambridge, St. Radegund (Jesus College)—Benedictine nuns—*c.* 1225.
Wimborne—Secular canons—*c.* 1230.
? Repton—Austin canons—? *c.* 1172.
Southwell Minster—Secular canons—*c.* 1240.
Howden—Secular canons—*c.* 1265.
Walsingham Priory—Austin canons—*c.* 1330.
Dorchester, Oxon—Austin canons—*c.* 1340.
Castle Acre—Cluniac monks—*c.* 1340.
Leiston, Suffolk—Premonstratensian canons removed here soon after 1389.
Hales Owen, Salop—Premonstratensian canons.

It will be seen that there is not a single large Benedictine abbey church in the list, nor any cathedral church, except one of the smallest of all, Rochester. On the other hand, it was evidently a favourite plan for the larger churches of the Regular canons, and to some extent of the Secular canons. In the North of England it includes Lavercost, Tynemouth, Finchale, Cartmel, Howden ; in the east, Leiston and Walsingham ; in the south, Rochester ; in the west, Llanthony, Hales Owen, and Wimborne ; in the Midlands there are examples at Oxford, Cambridge, Repton, Southwell, and Dorchester. Of these the finest examples are at Rochester and Southwell.

There is considerable difficulty in differentiating this from the last group, for it is not always easy to say whether a projecting unaisled eastern limb is a presbytery or a Lady Chapel, especially as in some cases the high altar does not occupy its original position. Where the church was dedicated to St. Mary, as at Cartmel, Tynemouth, and Southwell, no separate Lady Chapel being required, the eastern limb is probably a presbytery. The original position of the high altar may sometimes be determined by the survival of its supports, *e.g.*, in the crypt of Rochester. And important sedilia are more likely to be a mark of a presbytery than of a Lady Chapel, *e.g.*, at Dorchester, Southwell, Wimborne. At Oxford the Lady Chapel is known to have occupied the second aisle north of the choir ; at Rochester, at any rate, in and after 1322, the Lady Chapel was in the south transept.

Fig. 21. *Waverley Abbey* (1128).

Ninth group; type, Waverley Abbey (1128).—The next is a very important group of churches. In it the eastern limb is without aisles and is used solely as presbytery. The choir occupies the crossing and one or more of the eastern bays of the nave. There are no chapels attached to the eastern limb, what chapels there are being confined to the east side of the transept. There is no processional aisle round the high altar. The merit of the plan is that the presbytery and high altar are well lighted. The defects are the absence of a processional aisle and of eastern chapels. In several cases, *e.g.*, at Fountains and Rievaulx, the eastern limb was subsequently remodelled to provide them.

This plan—with short unaisled presbytery—is especially noteworthy for its occurrence in so many Cistercian churches viz., Waverley (1), Tintern (1), Quarre, Calder, Fountains (1), Louth, Dore (1), Buildwas, Furness, Kirkstall, Roche, Bindon, Cleeve, Strata Florida, Valle Crucis, Basingwerk, Sallay or Sawley (1). It is also the most common plan in the Premonstratensian churches of which we have knowledge, occurring at Easby, Shapp, Dale, Alnwick, Blanchland, Eglestone, Torre, Bayham. It occurs also in numerous churches of second or third rank belonging to other orders, *e.g.* :—

Lindisfarne Priory—Benedictine monks—*c.* 1128.
Ewenny Priory—Benedictine monks—*c.* 1147.
Llanthony Priory—Austin canons—*c.* 1180.
Brinkburn Priory—Austin canons—*c.* 1190.
Nuneaton—Benedictine nuns—*c.* 1225.
Little Marlow—Benedictine nuns.
Brecon Priory—Benedictine monks—*c.* 1225.
Ulverscroft Priory—Austin canons—*c.* 1275.

Tenth group; type, Bolton Priory.—The next and last group also has an eastern limb unprovided either with side aisles, eastern ambulatory, or eastern chapels, but well lighted. These churches differ from the last group in that there is crowded into the eastern limb the choir as well as the presbytery. At this point the collegiate church and the parish church meet ; for plainly the eastern limb of the collegiate church divided into choir and presbytery is the same as the parish church chancel, which has precisely the same divisions. The collegiate church indeed often professes itself something more than parochial by transept and central tower. But many a parish church, too, had transept and central tower, and not unfrequently rivalled the collegiate churches in plan, area, and grandeur, *e.g.*, Patrington ; and, on the other hand, many a church was collegiate only as regards its chancel. To this group belong churches, too numerous to mention, some served by Austin canons, others by Secular canons, or otherwise, *e.g.* :—

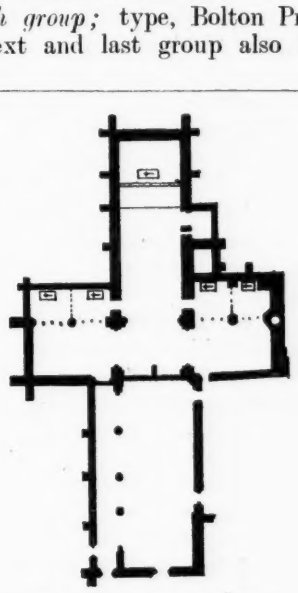


Fig. 22. *Bolton Priory.*

Lilleshall, Salop—Austin canons—1145.
Bolton, Yorks.—Austin canons—*c.* 1151 ; eastern limb prolonged, *c.* 1330.
Newark, Surrey—Austin canons—*c.* 1220.
Maxtoke, Warwick—Austin canons—1336.
Norton Subcourse, Norfolk.

This latter is almost a *reductio ad absurdum* of a collegiate church. It was originally a parish church, with unaisled nave and short, narrow unaisled chancel. When the college of priests was transferred to it in 1387 from Raveningham, all that was done to the church was to pull down the parochial chancel, and to substitute a longer chancel as broad as the nave for the stalls of the canons. This was frequently the case where the college was small ; the parish nave was left untouched, merely a more spacious chancel was built. A magnificent example of this is the spacious aisled chancel of the collegiate church of Wingfield, Suffolk, with two windows in each bay of its clearstory, whereas in each bay of the nave clearstory there is but one.*

Fig. 23. *Norton Subcourse.*

NOTES.

Suburbs and Building Control.

THE deputation to the Prime Minister and the President of the Local Government Board on the question of the planning of suburbs, put forward figures estimating that a saving of 13,000,000*l.* to 14,000,000*l.* would have been effected during the past thirty years if sufficient foresight had been used in planning suburbs, since an enormous sum had been expended in widening streets which should never have been laid out, and pulling down buildings which should never have been erected. It may be a question whether much weight attaches to figures such as the above, which are, *ex post facto*, based on a knowledge of events which could not have been foreseen. The important point to be noted is that the deputation advocated the municipalities having increased powers given to them to enable them to purchase, develop, and sell land—in other words, that the municipalities should be enabled to become land companies. Both the Prime Minister and Mr. Burns expressed sympathy with the deputation's views, and the latter said two Bills were in preparation—a Housing Bill and a Town Planning Bill—which would be found preferable to any schemes propounded by the deputation. It remains to be seen what the nature of these Bills may be, and at the present moment it is sufficient to point out that the improvement of future suburbs can be attained, and the lessons of the past can be put into practice without enabling the municipalities to become land companies. With the taste some of the municipalities have developed for speculation, land purchase no doubt offers an attractive field for new enterprise, but their functions should be administrative and not commercial, and private enterprise can easily be efficiently controlled and directed by legislation and by-laws.

The Patents and Designs Bill.

ON the consideration of the Patents and Designs Bill as amended by Committee, a new clause was added to the Bill by a majority of 104 votes in the House of Commons. This clause is as follows :

* To be continued.

"A patentee shall not be entitled to recover any damages in an action for infringement commenced after the commencement of this Act from any defendant who proves that at the date of the infringement he was not aware of the existence of the patent." And the clause proceeds that the marking of an article with the words patent, patenteed, etc., shall not be deemed to constitute notice of the existence of the patent unless the words are accompanied with the year and number of the patent. The clause was softened down by making it apply only to patents granted after the passing of the Bill, and by requiring that the defendant must show that he had no reasonable means of making himself aware of the existence of the patent. It is to be observed that the clause is limited to "damages" and does not take away the right to take proceedings for an injunction. A number of members urged that the clause required further consideration, and we are inclined to agree with them. It is impossible to mark certain articles, such as chemicals, flour, etc., and the same difficulty may be experienced with certain small improvements effected in machinery. Lawyers are also well aware of the difficulty of substantiating whether or no a person has had reasonable means of making himself acquainted with particular facts. The knowledge that damages will be incurred if a certain course be adopted is a strong deterrent, but an injunction without damages has little effect, as it enables unscrupulous persons to "run the racket" until they are stopped. Although it may be right to protect the really innocent it seems a great question whether this clause will not unnecessarily prejudice the security of patent rights.

Drains and Sewers. THE case of Wood *v.* Ealing Tenants, Ltd. (current *Law Reports*) raised another question in connexion with the curious state of the law relating to sewers and drains. The plaintiff had erected a house at Ealing. At the foot of his land was a private passage belonging to the defendants, and down this passage, one foot from the plaintiff's wall, was a pipe which received the drainages of several houses belonging to the defendants. These houses all being in the same ownership by draining into this pipe constituted it "a sewer" within the meaning of the Public Health Act, 1875, sect. 4. (See also Travis *v.* Uttley, 1893.) By sect. 21 of the same Act the owner of premises within the district of a local authority is entitled to cause his drains to empty into the sewers of that authority. The local authority, at the request of the plaintiff, connected his drain with the sewer, but the defendants, after notice, removed the connecting pipe, contending that it constituted a trespass. The plaintiff then brought this action for trespass against the defendants, but the Divisional Court held that the action would not lie. Although this pipe had been converted into a sewer, and the sewer was, therefore, one which had to be maintained by the local authority, as it was not a sewer laid by them on land for which they had paid compensation, the Court held that neither the plaintiff nor the local authority had any right to lay a connexion on the defendants' land without leave. The result is that, although the defendants have a drain on private property, which owing to fortuitous circumstances has become converted into a sewer relieving the defendants from the expense of maintaining it, yet the local authority cannot claim any right to connect with it.

The River Wear Double-decked Bridge. FOR some not very obvious reasons double-decked bridges have found little favour in this country so far, although a successful example has long been afforded by the well-known high-level bridge at Newcastle. Mr. Harrison, the Engineer to the North-Eastern Railway, is now engaged in the completion of a structure over the River Wear at Sunderland, providing accommodation for railway lines on the upper platform and for highway traffic on that below. The total length of the bridge is $1\frac{3}{4}$ miles, including the approaches, and the work includes four steel girder spans of 220 ft., 224 ft. 6 in., 355 ft., and 222 ft. 6 in. respectively, the longest span being over the river and giving the clear headway of 85 ft. at high water. The abutments and piers are of Norwegian granite, laid in Portland cement, and the approaches are of Dumfriesshire red sandstone. In building the north pier for the river span, a steel caisson was employed, which was sunk to the depth of 75 ft. below high-water level, the masonry being built upon the top of the caisson during the process of sinking, thus avoiding the necessity for the construction of a temporary cofferdam. This novel method of procedure could doubtless be followed elsewhere with considerable advantage as an alternative to the usual practice.

Vendors of Houses and Rights to Light and Drainage. TWO POINTS, one relating to light, the other relating to a sewer, were raised in connexion with the sale of house property in the case of Pemsel & Wilson *v.* Tucker (current *Law Reports*). The purchasers of two houses, under an open contract, were objecting to complete the purchase on the ground of defect in title. As regards the light. The vendor had previously disposed of the property adjoining that now being sold, and he had then entered into a covenant that neither he nor the purchaser of that property would do anything to interfere with the light to the existing windows. The houses were only erected in 1892, and therefore no rights to light had been acquired by prescription. The effect of the above covenant was not only to give the adjoining owners such a right to light as could eventually be acquired by prescription, but it was an express contract not to interfere with the light to the existing windows, and the Court held that it prevented the vendor from giving a perfect title. The second objection was somewhat more complicated. A drain ran under the property which took the drainage of the house the subject of the contract, the drainage of the house previously sold by the same owner, and the drainage of a third house in different ownership. The purchasers contended that this was a "sewer," and that as a sewer it vested in the local authority by virtue of sect. 13 of the Public Health Act, 1875, and therefore the vendor was unable to give a title to the whole of the property. On the other side, it was contended that by virtue of sect. 19 of the Public Health Acts Amendment Act, 1890, this was not a sewer, but a private drain draining houses in different ownership. The finding of the Court was that although under the latter Act this was a "drain," it was so for the particular purposes of that Act alone, but it still was vested in the local authority as a "sewer" under the provisions of the Public Health Act, 1875, and therefore a good title could not be given to the whole of the property intended to be conveyed. Thus vendors of house property must be very careful to ascertain the character of the system of drainage and disclose its nature, or it may prove a ground for avoiding the contract of sale.

Proposed Tramway Extensions. TAKEN as a whole, the recommendations about to be brought before the London County Council by the Highways Committee of the same body are quite worthy of support. With two exceptions the new lines proposed are short extensions which will serve the purpose of linking up existing routes, and if executed concurrently with the conversion of the present horse tramways, they should have the effect in some cases of avoiding heavy expenditure on street improvements. Among the smaller projects contemplated are connecting lines between Gray's Inn-road and Caledonian-road over the Metropolitan Railway Station at King's Cross, Essex-road and Kingsland-road, Kingsland and Hackney, Blackfriars-road and Southwark Bridge, Lea Bridge-road and Lower Clapton, and Tooting Broadway and Tooting Junction. The present time is especially favourable for the first-mentioned junction, as the Metropolitan Railway Company are about to carry out structural alterations at King's Cross Station. The two larger schemes included in the programme provide for the construction of new lines on the overhead system from West Norwood and Forest Hill, respectively, to the Crystal Palace, where connexion will be made with the system of the Croydon Corporation. Including the sum of 122,000*l.* for street improvements, the total outlay contemplated is about 351,000*l.*, an amount which would be well spent in the directions indicated. All the smaller links are urgently needed, and the two outlying lines are distinctly advisable for the purpose of providing more adequate traffic facilities in the south-eastern suburbs.

A New Theory of Corrosion. AT a recent meeting of the American Society of Testing Materials, Dr. Cushman of the United States Department of Agriculture, brought forward some novel views relative to the causes of the corrosion of iron and steel. It has been generally recognised hitherto that water, oxygen, and an acid (usually carbonic acid) were responsible for corrosion, and that in the absence of any one of these substances, little rusting would take place. A short time ago it was found by Mr. Moody that in the absence of carbonic acid gas, or other acid, no corrosion could occur. Dr. Cushman goes a step further by showing that the first attack is made

on iron by hydrogen in the form of ions, the action being electrolytic and accompanied by an exchange of the electrostatic relations between the metal and the hydrogen. His investigations were extended to an inquiry into the means of preventing corrosion so caused, the remedy proposed being the treatment of iron and steel by a solution of an oxidising agent, such as bichromate of potash, the effect of which is to polarise the metal to the condition of an oxygen electrode, and thus to prevent the approach or attack of the hydrogen ion. It is stated that the polarisation thereby effected is more or less lasting, but it cannot be sufficiently so to justify reliance upon the process for the preservation of iron and steel in ordinary constructive practice. Although we are not yet within measurable distance of non-corrosive iron and steel, the results quoted certainly encourage the hope that methods of treatment far more efficaceous than mere painting may be evolved in due course.

Terminology in Decorative Art.

AT the British Association Professor Myres introduced a new subject, in the Anthropological Section, under the title "A Terminology of Decorative Art." The importance of this is perhaps more evident in connexion with anthropological than artistic study. It amounts to this—that the special forms of decoration used by uncivilised and pre-historic peoples have a great deal of significance in regard to racial extraction and relation; and that while it is easy to give names to those decorations which are at all pictorial in character, there are no accepted names for the considerable number of combinations of lines in purely geometric ornament; and Professor Myres urged (and we quite agree with him) that a recognised and scientifically based terminology for distinguishing these classes of ornament is desirable. It should take account of the nature of the process employed by the artist, as well as the result; since some forms of ornament which differ very little in ultimate appearance differ very much in their method and principle of construction. The vocabulary, he suggests, would be made up partly by the coinage of words, as in geology, from Greek or other universal vocabularies; but he thought much might be done to fix current idiom by detailed descriptive analysis of some of the commoner geometrical forms, such as the triangle, the wavy line, the spiral, or the plait. Although these suggestions have been made with special reference to historic study, they are not without interest in connexion with art, where an analytical vocabulary of forms of abstract ornament seems certainly to be rather wanted. We have names (rather empirical) for certain ornaments—the "key-pattern," "bead-and-reel," "egg-and-tongue," etc.; but these are not very scientific in their character, and there are a good many minor varieties of geometrically derived ornament for which there is no recognised name.

ALMSHOUSES, LOWESTOFT.—An addition has been made to the fishermen's almshouses, situate on the Whapload-road, Lowestoft, by the erection of two houses at either end of the block. Mr. W. J. Roberts was the architect, and Mr. C. Allerton the contractor, Mr. W. Wilkins being the sub-contractor.

THE ARCHITECTURAL ASSOCIATION:

ANNUAL EXCURSION.

THE Church of St. Michael, Reepham, was the first objective of the Architectural Association's annual excursion, which is being held this week, Norwich being the headquarters. An early start was decreed by the Hon. Secretaries, and all the members were safely entrained at Norwich for Whitwell, where, in a deluge of rain, the excursion may be said to have begun.

The churchyard at Reepham is curious, and perhaps unique, for it at one time contained three distinct churches, two of which still remain, namely, St. Michael's, Reepham, and St. Mary's, Whitwell, separated by only a few inches, and each having its parish. A tale, current in the village, to account for this unusual proximity is that shortly after the original church was built three wealthy sisters who were the only people of importance in the neighbourhood disagreed in their views with regard to the most desirable form of ritual to be observed, and eventually built a church each to solve the difficulty. Be this as it may, the present churches belong to approximately the same period. Both have suffered considerably at the hands of the early restorer. Between 1780 and 1801 the open timber roof and clearstory of the Church of St. Mary was taken down, and about that time the stone windows were removed, being replaced by wooden frames; these, again, were subsequently taken out, and the stone tracery windows restored as far as possible without very conspicuous success, although no doubt correctly. The church has been very unfortunate with regard to settlements, and it was on this account that the above-mentioned work took place. There is a step down to the chancel and another step up at the altar rail; on the north wall of the chancel is a canopied tomb of considerable merit, being that of Sir Roger de Kerdiston, dated 1337, with a figure of the knight, in full armour, lying on the seashore, signifying that he was possessed of certain foreshore rights.

A later brass to Sir William de Kerdiston is by the altar rail, but has been much damaged. The rector showed the party an interesting graveyard cross which he had discovered in the north-east buttress of the chancel, and the plate, some few pieces of which date from the XVIIth century.

On the south side of the nave are some Early English caps belonging to a previous church, which have been reused in the present decorated structure; whilst the corresponding piers on the other side have distinctly marked decorated features. The arch mould on both sides is the plain chamfer in two orders, and the piers are octagonal. There are also some peculiarly rich poppy heads to the benches in the nave and chancel, and part of a fine Early English hinge to a door leading to the tower, which is placed off the south aisle. Another curious relic is an Early Norman font in Purbeck marble, much damaged, which the rector suggested was Saxon.

The adjoining Church of St. Mary, in Whitwell parish, is not of so much interest; the windows were all removed and subsequently restored in a rather cast-iron fashion, and the west end of the church is marred by a rather unpleasant gallery of comparatively modern date. A fine Early Jacobean oak roof to the chancel and a pulpit of the same date and character are the only noteworthy objects.

The party next visited Sale Church—a magnificent Early Perpendicular edifice now in a somewhat neglected state owing to lack of funds for repair work. The chancel is weatherproof, but in the nave the rain evidently finds its way through the beautiful open timber roof, which still shows traces of coloured decoration. The exterior is of fine squared black flint work, with stone coin and flush stone tracery in the parapets and small clearstory. The aisles are nearly the width of the nave, with small transepts—the projection of which is not even equal to the width of the aisles. As in most Norfolk churches, there is no triforium. The north and south porches are fairly large, and have parvises over. There is a fine font and cover, which is rather too suggestive of the fretsaw, also several good brasses. The real beauty of the church lies not so much in the detail, however, as in the noble proportions and sense of scale, more especially in the nave; and, externally, in the great west tower. The whole church was measured about twenty years ago by Mr. Yeats, who was able to explain several interesting points to those of the party who saw the building for the first time.

Having partaken of a hasty luncheon, the party once more resumed their pilgrimage, driving on to Melton Constable Hall, a very fine house, given in Mr. Belcher's book. The plan as shown is, however, misleading, as it does not indicate a large front entrance hall on the north side, having a portico of massive proportions and considerable size attached to it.

There is also a modern wing executed with care, and keeping the same lines and detail as the main house, which is merely indicated in the plan.

Unfortunately, it was impossible to obtain permission to see the interior, but most of the members found the time allotted for their stay was insufficient to get even a satisfactory view of the exterior. The date of the house as rebuilt is 1680, and it is the seat of Lord Hastings' family. The plan would appear to be nearly square, with two main internal walls dividing the interior longitudinally into three. The materials used are a fine grained greyish stone and thin red bricks of charmingly varied texture and rich colouring. A stone plinth forms the basement or lower ground floor, and above this is brick with stone coins and dressings. The cornice, which has a projection of about 3 ft., is of wood. In the centre of the garden front is a pediment, but on the west side the centre space is covered by a flat running back to the wall of the staircase, which is carried up with a very large semicircular headed window, about 8 ft. to 10 ft. wide, evidently lighting

Old House at Norwich.

the staircase; the roof on each side is hipped back, and the main central space is covered with a large square flat.

On the same front is a graceful little loggia of four slender Ionic columns comprising the space in front of the three central windows to the ground floor. The brick chimneys are massive, but effectively placed, and the whole house has a dignity not to be denied. The members also noticed the admirably-kept sunk garden in front of the house on the south and west, and walked through the kitchen-garden lying to the eastward, enclosed by high brick walls, where they saw a large vinery and several greenhouses; also two fine lead tanks dated 1757.

On the way to the station the members passed the small church, which apparently was originally Norman, and has been altered at each successive period, so that it has one or two windows of each style.

Having managed to procure tea at the station, the party returned to Norwich at six o'clock, quite satisfied with the first day's work.

Tuesday, August 13.

Leaving Norwich at 8.15, the party arrived at the first halting-place, Attleborough, shortly after nine o'clock, and immediately walked to the church, which is now undergoing extensive repairs. As it stands, the building is late Decorated,

probably the latter half of the XIVth century, but at the crossing under the central tower the earlier Norman work has been left in the central space; on either side are small transepts of the same period as the remainder of the building, but the chancel is missing. The body of the church consists of a nave of five bays with two aisles and a small clearstory; the side walls of the aisles have arcading corresponding to the bays of the nave, and, in the centre of each, are windows with rather uncommon tracery divided into three lights, with a large quatrefoil in the head of the window. There is also a fine window at the west end at present blocked by the great rood-screen which has been placed at this end of the edifice, whilst the reparation work is going on. This screen is almost perfect; only some of the smaller details, principally the double order of cusping, having been damaged; it was evidently much decorated with colour and gilding, some of which still remains, but, owing to the scaffolding, etc., it is impossible to see it properly. The exterior does not possess any exceptional characteristics—there is a good Norman and Early English tower, and north porch, with a parvis over it, and the roof is covered with lead which is now being recast. Of the fittings the most noteworthy is a very excellent and tasteful pulpit belonging to the early years of the XVIIth century, which attracted many admirers; it has some beautifully executed and designed carving on mouldings, and in what might be called the frieze; the plan is hexagonal, with a panelled front on each side save the door, which is missing; in the raised central panel there is in each case a wood inlay. In the frieze are cherubs' heads and branches of foliage, etc. The material is old oak waxed and dull polished. There are also, we believe, several monuments of interest, but the party did not see them. From Attleborough the members drove on, and after several circuitous routes reached Breccles Hall—an interesting Jacobean building in a lamentable condition—which is now being repaired and added to by Mr. Detmar Blow. The house was practically a ruin, and consequently the work is very extensive. Its chief charm lies in the beautiful warm tone of the old brickwork, with wide joints and long thin bricks; the chimneys, too, are of pleasing design, and well grouped; and the house is an ideal subject for water-colour; however, time did not allow of experiment in this direction, and, after a wayside lunch, the members made a hasty visit to the Early English church, and saw a recently discovered churchyard cross base and ancient font. They then drove on to Hingham, a fine, lofty, Decorated church six bays in length, with a good hammerbeam roof, which has been rather too obviously restored. The choir roof, a triple hammerbeam of timid design, is pleasing, chiefly on account of its colour and mellow tone. The east end of the chancel is occupied by a Perpendicular window of curious design, with a transom running through the tracery just about the springing. To the left, on the north wall, is the large Elizabethan tomb of Thomas, Lord Morley, which suffered considerably at the time of the Reformation; and to the right are the remains of a carved and coloured Perpendicular sedilia and piscina. A Spanish station of the cross in silver at the end of the south aisle is a rather interesting and beautiful piece of work, which, together with two silver mirrors, were sent over by Sir Philip Currie, a brother of the late rector. At the entrance to the churchyard the members noticed a pair of excellent wrought-iron gates, before driving on to Wymondham, a most remarkable and striking church, with two magnificent towers to the east and west of the present church.

[Our report will be concluded next week.]

WATER CHARGES BILL.—The Metropolitan Water Board (Charges, etc.) Bill was read a third time in the House of Commons on Friday last week.

ENLARGEMENT OF THE WEST HAM HOSPITAL.—A new wing is being built and various improvements carried out at this hospital. The plans, prepared by Mr. Percy Adams, provide for a new casualty department, a new and up-to-date operating theatre, two new wards containing twenty beds each, and additional accommodation for the nursing staff. The estimated cost of carrying out this extension is about 20,000*l*.

MAGAZINES AND REVIEWS.

THE *Art Journal* continues the articles on Irish scenery by Mr. Yockney, with Mr. W. Monk's excellent illustrations. This month it is "'Midst the Mountains of Mayo." Mr. Monk's sketch of Ballina is a charming composition, and one is not surprised at the remark that "Ballina looks foreign to the eye"; our first impression from the drawing was that it suggested a Continental town. In this issue is the first of a series of article on "Scottish Arts and Crafts"; really a series of illustrations accompanied by a few comments. There is nothing specially Scottish about the examples given; indeed, Mr. Talbot's "Waist-clasp" is rather decidedly Irish in character; most of the designs are such as might be seen in an Arts and Crafts exhibition in London; but the article serves to bring into notice the work (chiefly) of some of the Glasgow artists. There is a distinct individuality in the examples of architecture by Mr. John A. Campbell, of Glasgow; so there is in Mr. Ramsay Traquair's metalwork, but we do not altogether like it; it is too realistic, and there is too obvious a striving after originality. Still less do we like the naturalistic metal flowers in Messrs. Mitchell & Wilson's "Grille to Cover a Glass Window." The frontispiece to the number is a mezzotint after Fragonard's "Fountain of Love," one of his finest compositions. Under the heading "Passing Events" we see one of those absurd charges which it is the fashion to make against the Royal Academy, viz.: that they rejected Rodin's "Age of Bronze" when sent to them as a new work, and last year placed the name of its sculptor among those nominated for Honorary Foreign Academicianship. We have before seen this work referred to in an English art periodical as one unknown in England. We beg to say that we first saw "L'Age d'Airain" *at the Royal Academy exhibition* some twenty-five years ago (more or less), where it stood as the first exhibit in the Octagon Room, immediately on the left of the entrance, and was entered in the Catalogue under its French title. The fact is that Rodin was not the fashion then, and very likely none of the "art-critics" noticed it except the present one, who knows better than to follow the fashions. Probably the Academy would refuse at the present day any of Rodin's eccentricities of figures without heads or without arms, and they would be quite right; but when he sent them a fine and completely finished work they accepted it, as we have no doubt they would now.

The *Burlington* is less varied than usual this month, but not less interesting, as the greater part of it is occupied by a series of reproductions of landscape studies by Claude, chiefly from drawings in the Oxford University Galleries and the British Museum, accompanied by a critical essay on Claude by Mr. Roger E. Fry, which is admirably written, and with which we are able to agree almost entirely. The sketches are of unequal value; some of them are very slight; but the majority are fine, and, as Mr. Fry remarks, they are characterised by a breadth and freedom of style which we do not find in Claude's finished pictures. Those which deal with pure landscape, and especially with trees, are the finest; but two which are mainly architectural are of considerable interest. One of these is a sketch of the Arch of Constantine (British Museum), as it was then to be seen half-buried in the uncleared rubbish of centuries. Modern exploration has added great things to our historical knowledge, but the poetry of these old half-buried remains of Rome has gone. The other, the last of the series, is "The Tower of Babel" (British Museum). The "tower" is only a conical object in the middle distance; the essence of the picture is the piled-up composition of buildings on the right, which would have been better if the artist had taken the trouble to keep a vertical line in the buildings, but the whole has the making of a great picture in it.

The *Architectural Record* (New York) contains an article of some interest by Mr. E. R. Smith, Reference Librarian at the Avery Architectural Library, Columbia University, on "Baron Haussmann and the Topographical Transformation of Paris under Napoléon III." The special object of the article is to defend the Haussmann remodelling of Paris, not only as a fine piece of city improvement in itself, but as being actually a continuation and completion of street schemes which were contemplated and not indistinctly indicated under Louis XIV. We quote the following passage in regard to this particular point:—

"It was the special task of Paris in the Bourbon period to invent and carry to perfection the ideal street. The boulevard, or avenue, then created is fine in itself, with its clearly defined roadway and *trottoirs* and its cool rows of trees; but it is seen finer in its adaptation to the placing of monuments, either along its course or at either end, where distance furnishes axial vista and perspective. It was precisely this large sense of axial symmetry which was the most perfect product of the prolific reign of Louis XIV. and the true completion of the classic idea.

What the designers of this period did for architecture and the street they desired also to do for the plan of the city. It was logically in the course of events that they should seek an axis for the city of Paris; and to be expected that it should lie in the line of one of the arms of the Grande Croisée. The construction of the Tuileries palace in the time of Charles IX. furnished the base from which such an axis might be drawn. A line at right angles to the palace in the axis of its garden agreed well with the east and west arm of the Grande Croisée, and was nearly axial to the intended enlargement of the Louvre palace. As early as the reign of Henri IV. property in this direction beyond the *enciente* of Charles IX. was bought by the crown; and Marie de Medicis in the reign of Louis XIII. laid out the Cours-la-Reine along the northern bank of the river. The Cours-la-Reine first appears in the map of Boisseau in 1654, and is probably the first street built on the perfected modern type.

In 1637 the famous André le Nôtre succeeded his father as gardener of the Tuileries. He laid out the garden of the palace much as it is to-day, and it is quite reasonable to suppose that as "*Controlleur des Bâtiments*" to Louis XIV. he saw the opportunity for a great avenue in the axis of the garden leading over the hill to Neuilly. At any rate, this avenue is clearly defined in the earlier plan of Jouvin de Rochefort (1672) under the name "Avenue des Tuileries." The *rond-point* of the Place de Etoile appears in the plan of Roussel in 1731."

"Place de l'Etoile," of course, it ought to be; the author seems to be unacquainted with French, as he writes elsewhere, "Place du Throne" instead of "Place du Trône"; and, moreover, he gives the name of Roman Paris as "Lutitia" instead of "Lutetia." But he gives reproductions of a whole series of plans of Paris at different dates, which support his argument. It is so much the custom now to sneer at Haussmann and his avenues and *rond-points* that we are glad to meet with some defence of a man to whom the stately aspect of modern Paris is immediately due, and who was only carrying out what had been projected under Louis XIV. and partly carried out by the great Napoléon. In the same issue is an article by Mr. A. L. Frothingham on a model of St. Maclou, Rouen, of which two photographs are given, which was in the Archæological Museum at Rouen, and which he claims to have discovered to be a genuine mediæval model made in anticipation of the erection of the XVth century church, and unknown as such to eminent French archæologists who had specially dealt with Rouen. It is impossible, of course, to form any judgment on the model itself from photographs; if it is really a highly elaborate mediæval model made in advance of the intended building, it is of great, almost unique, interest; and some of the reasons given for thinking it so, arising from comparison of the model with the building, are quite logical. Still, when we find an American writer, in an American magazine, relating how he had confounded and reduced to silence various eminent French archæologists (M. Enlart among them) who had regarded it as a copied model made in the XVIIth century, we confess that we should like to have a report on the matter from the French archæologists' point of view, before accepting the conclusion as proven.

The *Berliner Architekturwelt* is chiefly occupied with illustrations of rooms and furniture design in the Berlin Art Exhibition of the present year; among which the most noticeable things are the series of rooms designed by Herr Bruno Paul, architect. These are worth the attention of architects interested in interior designs, because they have this special merit—that they show how rooms and furniture may be treated with simplicity of design and style without losing distinction and looking like cottage interiors.

The *Architektonische Rundschau* is entirely occupied with the Jubilee Art Exhibition at Mannheim, consisting of a building and of arrangements of garden designs, summer-houses, and garden sculpture, and a very interesting collection the illustrations make.

There is originality enough here, with some eccentricity, and we do not admire all the art displayed; but it is at all events quite devoid of common place. We give a reduction of the view of the entrance portal of the exhibition building, and also of one of the garden erections, with its curious treatment of the columns.

In *Modern Beauformen* we fear the eccentricity overrides the art; but it is of some interest to turn over these various efforts at originality in architecture and furniture.

The *Contemporary* contains a very interesting and well-written article by Miss Emily Crawford under the title "Mediæval and Renaissance Portraiture," which is really a description of and comment on the exhibition of portraits at the Bibliothéque Nationale at Paris. It is full of information of a varied kind. We may quote part of the opening paragraphs, which among other things, give a reason for the small size of the pictures, none of which are later than the first half of the XVIIth century:—

"One need not be a connoisseur to find infinite pleasure in reading mediæval and renaissance history in the pictures at this exhibition. The first room gives the infancy of French art, which is so different from the second childhood betrayed in retrogression. The libraries of Toulouse, Besançon, Dijon, and The Hague, the Paris Arsenal, the National Library, the Library of St. Geneviève, and many private collections have contributed to this gathering together of graphic "documents" illustrative of so many reigns and moods and tenses of the most brilliant, enterprising, keenly perceptive, and imaginative people of the Western World.

The difficulty of transport in the Middle Age had a marked effect on pictorial art. Once the Roman roads lapsed into wild country, goods could only be transported on pack mules or horses. Other difficulties in the way of transport lay in the violence of the time—the claims for toll of the barons whose keeps or castles lay along the horse tracks, the frequency of morasses, and, at certain seasons, of swollen fords. The smaller the picture, the easier it was for the knight to stow it away in the gorget of his coat of mail."

The *Nineteenth Century* contains a rather remarkable article by Mr. Frederic Harrison on "Paris in 1851 and in 1907." It is very largely concerned with the difference in the City itself, architecturally, and in French art, since the commencement of the last half-century. It is always interesting to read the impressions on such a subject by a man of exceptional culture who is not an artist; and there is much in Mr. Harrison's reflections

Centre Building, Mannheim Jubilee Exhibition. Professor B lling, Architect.
(From the *Architektonische Rundschau*.)

Garden Pavilion, Mannheim Jubilee Exhibition. Professor Max Länger, Architect.
(From the *Architektonische Rundschau.*)

with which we agree. He is much impressed with the immense additions to the Art Museums of Paris, both the creation of new Art museums, such as the Carnavalet, the Guimet, and the Petit Palais, and the important additions to and alterations in the Louvre. As regards the gain or loss to Paris from the immense street improvements by which long straight avenues have been substituted for many of the narrow, picturesque, dirty, and winding streets of old Paris, he takes a very reasonable view, and does not question that some of these alterations are improvements; but we cannot agree with him in regretting the existence of the Opera House and its "Avenue." It is the fashion now to abuse Garnier's great building as a standing record of the showiness and corruption of the Second Empire, and it certainly is "Second Empire" all over; but after all, it is a wonderful building and a work of genius, and we cannot agree to wish it away. In regard to the painting of the former and the present period Mr. Harrison says:—

"One who remembers what French art was and has seen the Salons of the last fifty years must note a gradual descent. Not to speak of the painters and sculptors before the Third Empire [*sic*: we presume he means "Second Empire"], when one passes from the later French artists in the Louvre and the Luxembourg to the two Salons, what a contrast! What a fall! What *a pot pourri!* Compare these contorted nudities, these bleeding ruffians, these acres of pantomime tableaux, with Ingres, Delacroix, Gérome, Cabanel, Corot, Daubigny, Meissonier, Troyon, Millet, Pradier, Barye, Carpeaux—what a fall it is! No man of sense, of course, denies that there are still in France men who paint portraits full of life and colour, landscapes of truth, and now and then even of charm, men who can model the human figure with complete mastery, and almost everything except grace. There is no lack of skill of hand, industry, ambition, even a kind of perverse originality, in this cosmopolitan crowd of men and women who shout to us from 4,000 canvases and pedestals to look and see how clever they are."

There is some truth—too much, perhaps—in this; but it is overdrawn. In regard to landscape especially, the finest landscape-painting in the world is still to be seen at the Salon, and some of the finest figure-painting too, in spite of the enormous vulgarities which we dislike as much as Mr. Harrison does. And he is still more unjust, later on, to French sculpture, which is in fact far less debased by the modern spirit than painting, and in which is still to be found the greatest sculpture of the day, in not a few examples every year. But we can forgive the author a good deal for pointing out, what none of the art-critics appear to see, that the much belauded Rodin is a typical "decadent," and that his "Penseur" which was exhibited at the New Gallery, and is now erected in front of the Panthéon, is nothing but a "brawny ruffian" with no suggestion of "thought" about him. One charge which he makes against modern French painting, however, we cannot understand; it is a charge of a special kind of impropriety which he formulates in a foot-note in Latin, not wishing to speak too plainly in English. The present writer has seen every Salon for twenty years back, and never came across anything like what is described in Mr. Harrison's Latin foot-note; and we cannot understand how such a charge can be made, as a general one at all events.

Scribner, under "The Field of Art," publishes an article by Mr. W. Walton on "Works by living American painters in the Metropolitan Museum of Art" at New York. There are only two illustrations, one of which, "The Gulf Stream," by Winslow Homer, showing a small dismasted vessel rolling on the swell with one occupant, and two or three expectant sharks playing round, ought to be a fine and tragic picture, if the colour is equal to the design. As to the other artists mentioned, it is difficult to form an opinion from mere writing apart from illustrations, but we get some information about some painters whose names are little known to us. There is a good deal to be said for the suggestion that American museums should aim at making collections of their contemporary national art instead of "covering their walls with such examples of the art of Europe as opportunity may throw in their way, frequently at very heavy cost." Collections of the works of their own contemporary artists will be likely to be of increased value as time goes on. The issue contains a fine drawing by Mr. Rackham, in his best style, in illustration of a poem entitled "Pan o' Dreams."

In *Harper* Mr. E. S. Martin, in an article entitled "Moods of a City Square," gives a sketch of the history and the transformations of Madison Square, a name familiar even to those who have never been to New York, but a place apparently little familiar now to those who knew it many years ago, and do not find it changed for the better. The hideous triangular block of flats satirically called "The Flat-iron," now dominates its once sober and dignified architecture. Some effective coloured engravings illustrate the article.

Macmillan's Magazine (sadly dwindled from its old form and influence) contains an article headed "The Amateur Antiquary" which will arouse the sympathies of many of those who lament the gradual but apparently inevitable extinction of all that was quiet and beautiful in old English life, under the ruthless progress of modern means for facilitating locomotion.

"The pity of it is that the busy world often ruins what it would fain keep, and, admiring old things ignorantly, kills the life in them which alone makes them precious. It is like a child that clutches a butterfly and spoils it. An instance occurred not long ago, where it was proposed to run a service of motor-omnibuses through a district of little known, but beautiful, country, a tract of rich pastoral valleys nestling amid heathy uplands. What more natural than that the towns nearest to this should seek to make it more accessible? They were bitterly offended, I remember, when certain inhabitants of the threatened district pointed out that its charms would not survive their attentions. Yet that was probably the truth, for the chief beauty of this place was more than is visible to eyesight. An intangible essence lingered there of an earlier, homelier England. Its Elizabethan farm-houses, its deep water-meadows, its elms and shady lanes, as you descended to their peace from the upper heaths, were lovely by reason of their shy seclusion, where a Jacobean poet might still be dreaming on summer afternoons and not know that his century had gone by. But what becomes of this seclusion when townsfolk invade it from their motor-omnibus? Their coming is enough: at once it disappears, and the charm they have heard of and have paid to see is no longer present for their enjoyment."

At Compton, says the writer, the mortuary chapel, erected by Watts, attracts many visitors; but what is its real interest compared with that of the old village church? In the new chapel one is reminded of only one man; in the church "one is surrounded by the emotion and peace of centuries of village life." He is quite right, but we fear he preaches to deaf ears.

The *Antiquary* includes among its articles one on "The Little Green Shop in Cornhill," traditionally known as "Birch's," though it appears that the ownership passed out of the Birch family some time in the earlier half of last century. This shop front, the oldest existing one in London, has lately had its layers of paint cleaned off. We are glad to learn that the present owners appreciate its historic value, and are determined to preserve it.

The *Church Builder* (quarterly) contains an account and some illustrations of the old church of SS. Peter and Paul, Edenbridge, with its curious squat broach spire. The north wall is all shored up and said to be in a very precarious condition; and it is curious to learn that the cause is exactly the same as that which necessitated the taking down and rebuilding of the centre tower of Peterborough—the walls consist only of thin outer shells of masonry filled in with rubble between, with no bond. A lesson to modern builders that sins of this kind always revenge themselves in the end. Subscriptions are asked towards the necessary repair of the fabric.

INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.

THE International Congress on School Hygiene continued its sittings last week at London University, when the following subjects amongst others were discussed:—

The Central Hall System for Public Elementary Schools.

At the sitting of Section XI. on Wednesday, Mr. G. Topham Forest (Northumberland) read a paper on this subject, in the course of which he said that as an ordinary member of the architectural profession, who had special reasons for devoting some time to the study of school planning, he claimed to possess a particular interest in the subject. He felt that in its essentials the question of the advantage or disadvantage of a central hall in connexion with public elementary schools was one upon which the practical teacher or the medical officer of health were more entitled to a patient hearing than the architect. They must look to the educationalists and the guardians of public health to tell them what they wanted, and it should be their business to provide it economically, and he hoped efficiently. He had always held that the scheme of education drawn up for any particular school formed the first conception of the type of plan, and since the passing of the Education Act of 1902 he had observed that those now in authority had devoted themselves more closely to the best needs of the child with regard to a well-planned school than heretofore and had worked in collaboration with the architect, with the result that to-day the whole system of school planning was on a new footing. Children

were now receiving permanent benefit from being taught in schools having all the latest hygienic improvements, and where the arrangement of the plan, both for the work of teaching and with a view to effective lighting, heating, and ventilation, had been the chief consideration, and not, as was the case in the schools erected some years ago by architects who, he was sorry to say, concerned themselves chiefly with external appearance and seriously neglected the requirements of school hygiene. Elementary schools were now invariably planned either on the corridor or the central hall system. The prototype of the English public elementary school was that of the ancient grammar school, which consisted of a large hall and which represented the whole of the teaching accommodation, and in which were seated pupils of different ages taught by one master. Having traced the various developments of the English school, Mr. Forest said that finally the late School Board for London built a school with classrooms for not more than eighty each and with a separate teacher for each room, the large schoolroom or hall being used only for one class. The general scheme of that plan was the type of school now being built, except with regard to the modern principles of heating and ventilation and that no children were now allowed to be taught in the hall. Recently, however, the question had again cropped up as to whether the advantages of a large hall adequately compensated for the extra expense involved in its erection. In his official capacity as architect to the Education Committee of a County Council he had always favoured a large hall to schools for 250 and upwards, his argument in favour of its use being that it materially helped the ventilation of the classrooms during the winter months on account of the comparatively small area of floor space architects were tied down to at the present time in the designing of these rooms and the lack of a cubic unit. The Board of Education gave 10 sq. ft. per child as the best for architects to work upon when designing public elementary schools, and 18 sq. ft. per child for secondary schools. He felt that 10 sq. ft. was far too little, and would never allow of satisfactory results as regarded the efficient ventilation of the rooms. Taking the average classroom for sixty children, each of whom should have a minimum of 30 cubic ft. of air per minute, the problem naturally presented itself how this air could be renewed, say, six times per hour, without such a lowering of the temperature of the rooms as would lead to closing the ventilating openings. Mr. Forest proceeded to enter into a series of calculations showing that a classroom of sixty pupils required 120,000 cubic ft. of pure air per hour. The fresh air inlets were usually about 18 in. by 12 in., but very often smaller. This gave a clear air way of 144 sq. in., or 1 sq. ft., allowing for the loss of a third in the mesh, and it allowed of 21,600 cubic ft. passing into the room per hour per sq. ft. of inlet. It was evident, therefore, that this amount of opening would supply less than a quarter of the quantity of air required. He was excluding the fresh air drawn from the windows, as these were invariably kept shut during cold weather, and the ventilation to the classrooms was drawn entirely from the wall openings. Air passed through two openings of the indicated size in order to be sufficient would have to travel at the rate of about 8 ft. per second, a current of air which would be dangerous to the children, as the velocity should in no case exceed 6 ft. per second. He contended, therefore, that until the time came when a larger floor space would be given to elementary schools a central or assembly hall was of immense benefit. The hall could always be kept freshly ventilated, and the glass screen between it and the classrooms made with opening sashes so that the pure air could be drawn into the classrooms. He held that assembly halls acted as large air wells to the various classrooms, more especially if one side had an external wall well supplied with large windows, all of which could be made to open and shut, and having the extract shaft in the ceiling under control. The temperature could be kept lower than that of the classrooms by having a separate circuit from the boiler. The argument in favour of ventilating classrooms through the central hall was that fresh warmed air was admitted through both sides of the room. Some large provincial education authorities had ceased to have the central hall principle on account of mechanical ventilation being imperative, but he felt confident that if the ventilation and temperature of a hall such as he had described were kept properly working the ventilation of the classroom would be materially helped, especially in the winter months when it was impossible to open the windows. As to the advantages of the hall from the teachers' point of view, in school hours facility was afforded for control by the head teacher without necessarily entering any classroom. In the elementary schools of Scotland the stairs to the upper floors were formed at each end of the hall, and the halls had galleries running round the first and second floors. As regarded supervision, he knew of no better arrangement. Another advantage of the central hall was that the glazed screens between it and the classrooms helped materially in the lighting of these rooms. The light from this side was shaded, leaving the chief source of illumination from the left. As to the disadvantages of the system, the greatest drawback was the expense, especially in schools of one department of about 300 children, for the cost was often brought up to 13*l.* or 14*l.* per head. When more than one department had to be provided for the expense was obviated to some extent by the Board of Education allowing one hall to be used at different times by the two departments. The hall surrounded on all sides by classrooms was bad, as it was impossible to keep such a hall adequately ventilated, except by mechanical means. In stormy weather it formed a snow trap which seldom got cleared out. There was always the possibility of water collecting in the long hidden gutter which was always difficult to get away. To obviate this it would be necessary to keep the hall dry, which added considerably to the expense.

Dr. Geo. Reid (Medical Officer of Health for Staffordshire) described what is known as the Staffordshire School. When the County Council was made the education authority plans of schools were submitted to him for his approval generally with regard to the hygienic conditions, and he could not see how with the central hall the school could be ventilated without mechanical means. The Education Committee referred it to Mr. Hutchinson, the architect, and himself to consider what alternative plans might be adopted, and they came to the conclusion that the only alternative was the pavilion type of school, and at the same time they provided a central hall to serve the three departments, detached from the classrooms, but communicating with the classrooms by means of a veranda. They had considerable difficulty in getting the Board of Education to accept the plans, but eventually they were allowed on the condition that they put in ceiling ventilators. This seemed to them a needless cost, and they got the Board to agree to have ceiling ventilators only in one room, but that if this was not satisfactory such ventilators should be placed in other rooms. He hoped soon to be able to publish the records of the analysis of the air taken from the different rooms. They had no ventilation openings so called near the ceiling. All the openings in these pavilion schools were from 5 ft. to 6 ft. from the ground, and consisted of hoppers extending across the whole width of the sash window. These openings were practically always kept open. In all weather it was a standing order that the windows were to be open during the dinner interval and for a time after the closing of the school, and the reason that was possible was that they provided a much larger heating surface in the way of low-pressure water circuits than would otherwise be required in different circumstances. The walls were consequently kept warm.

Mr. P. Morris (Architect to the Devon Education Committee) said that with regard to Mr. Forest's argument that the central hall was a valuable means of ventilation he did not see why the corridor should not be equally good for that purpose. It ought, however, to be laid down that one wall of the corridor or of the central hall should be an external wall. He thought they might eventually turn their attention with advantage to the provision of central halls made after the style of a verandah, so that in summer-time the windows might be thrown open. Mr. Forest said it was not possible to leave the windows open in the winter, but in his county there were hundreds of schools where the windows were kept open from one year's end to the other. He thought windows were the most efficient means of ventilating classrooms, but it required intelligent use on the part of the teacher, and the temperature should be taken outside the room instead of in. He could not think the cost of a central hall school was altogether greater than the corridor school. He was at present building a school in which he was not allowed to have a central hall, but he was perfectly certain he could have provided it at as little cost as a school of the corridor type.

Dr. J. Robertson (Birmingham) remarked that the conclusion he had come to was that the systems of mechanical ventilation he had seen were more or less bad, and he advocated getting rid of such systems, except perhaps in the case of schools in the centre of large towns where there was a very sooty atmosphere.

Mr. Felix Clay (Board of Education) said he considered that as a matter of planning there was a good deal to be said for the central hall. With proper organisation the hall could be used with great effect, and it added to the corporate life of a school. The question of classrooms all round a hall was further complicated if they wanted to give a good aspect to each room. The planning of the modern elementary school had developed quite as much from the corridor as from the old schoolroom, and if they got a corridor 20 ft. wide with classrooms on either side they might just as well call it a central hall. The first central hall school was built in 1872 by Rogers Smith. It was the Ben Johnson school in London, and was considered at the time as being most unsuitable. The whole thing was dropped for ten years, and then was taken up again. The question of the 10 ft. per child in an elementary school was bound up with another question, because with a class of sixty children if greater space was enforced the children would neither hear the teacher nor see the blackboard. The question of ventilation was bound up to some extent with that of lighting, and if they had a room with windows on each side the children would have a much stronger light on the right-hand side, and oculists might object to that. There was no doubt that hot air used for ventilating or warming rooms lost something which chemical analysis had not yet shown. The air seemed to lose its invigorating qualities in some way.

Mr. J. A. O. Allan (Aberdeen) said he felt that while no one seemed to think of substituting mechanical ventilation for natural ventilation in a house, yet where they had to deal with a large number of children in a school in the centre of a large city mechanical ventilation should have consideration at least. In Aberdeen the schools cost 15,000*l.* or 16,000*l.*, which worked out at about 13*l.* per head. The difficulty with regard to natural ventilation was that when change of air was most needed it was impossible to get it owing to the vagaries of the weather, and in very warm weather they got practically no ventilation. It was said that by mechanical ventilation the air lost something, and it was true that if the air was heated to an extreme it got dry, but that could be remedied. He would entirely abolish central heating, for he believed that mechanical ventilation was largely judged by that. In Aberdeen they had a heated coil for every classroom, and the heat applied to the coils was not excessive.

Mr. Pugh Jones (Glamorgan) observed that in his county every school had ceiling ventilators. He believed the Staffordshire schools were heated by low-pressure water-pipes, and he would like to know how they managed to carry the pipes with so large a number of wall openings. Also he wished that Dr. Reid would tell them the cost per head. His schools cost, roughly speaking, from 14*l.* to 15*l.* per head, and everyone of them were made on the central hall system, which they found very satisfactory. As a rule, they had one side of the hall open or the two ends. Further, he would like to know what flooring they used in Staffordshire.

Mr. A. Lang (Architect to the Heston and

Isleworth Education Committee) pointed out that where they used the central hall of schools for drilling they had the children bringing in dirt and depositing it on the floor, and that dust floated about in the air and passed into the classrooms through the windows. Consequently it was rather a dangerous argument to claim as a merit for the central hall that it could be used for ventilation. Surely it behoved them to see that they drew their supply of air from a pure source. He was afraid that most ventilating engineers aimed at getting one system to apply to every case, and that was the reason of the failure in so many cases. He preferred natural ventilation, but he did not think it sufficient in all cases.

Mr. J. Osborne Smith said that in this question of the planning of schools it was most important that they should welcome all points of view, and they were fortunate that day in having heard the views of both an architect and a medical officer. The central hall system of planning had undoubtedly great merits, and so had the corridor system, but the arguments which had been used against the central hall had been used against the central hall of one story only. Where they had a central hall of two stories it was possible to get more efficient ventilation. One thing they ought to emphasise was the feeling against the central hall entirely surrounded by class-rooms. He was in a school the previous day where the central hall was entirely surrounded by classrooms, and that school cost 100*l.* per head. The single-story central hall they saw around them in London, 14 ft. high and 25 ft. to 28 ft. wide, was a difficult room in which to get the conditions which Mr. Forest had referred to. It was almost impossible to get perflation in such a room. If the central hall was used for drilling it was true that dust was engendered, but that raised the question of the use of a central hall. He could testify that hoppers about 5 ft. above the floor were an extremely convenient way of getting cross-currents with a minimum of draughts. He had seen children sitting in a secondary school with the windows wide open when there was a sharp frost outside, and the teacher told him that the girls could not sit in a room with the windows shut as they had been brought up so. That was the whole thing. If children were brought up to have ventilation there was no difficulty.

Mr. Forest, replying on some of the points raised, said that his experience both in Northumberland and the West Riding of Yorkshire was that the central hall was not used, but if it were arrangements could surely be made to ventilate it. He was putting up fourteen schools now, and he insisted on the schools being of first-class material. He found that the children drilled outside, and he had part of the play-ground covered in every school. He had laid down a series of rules with regard to ventilation of rooms, and the teachers were instructed to carry them out. He had been speaking of country schools of one story, and if they attempted to mechanically ventilate such schools they would get into serious trouble on the score of expense.

Dr. Reid agreed that mechanical ventilation was valuable in large public buildings, but he was sorry to hear they had adopted it in the schools at Aberdeen. The method of introducing heat in the Staffordshire schools was not quite as he would personally have liked, but they had to consider the cost. It was by means of pipes carried along the skirting board sufficiently high to allow of dusting and sufficiently apart for the cleaning. They had built a school for 1,020 children at 10*l.* 10s. per head, one for 680 children at 11*l.* 1s. per head, and a small school at 10*l.* per head. The central hall schools cost 15*l.* per head. Their flooring was 3 in. wide boards nailed to the breeze concrete with concealed nails.

The Lighting and Ventilation of Classrooms.

At a general meeting of the Congress on Wednesday Sir Aston Webb, R.A., F.R.I.B.A., delivered the following address on the "Lighting and Ventilation of Class-rooms":—"I am afraid that there is nothing very new that can possibly be said on the subject of lighting and heating and ventilation of classrooms, and certainly for myself I do not propose to make any claim to originality. What I propose to do is rather to tell you what my own experience of this question has been and what I believe is the present best practice now carried on in England. If this is all known to our English *confrères*, possibly some who come from more distant parts will be interested to know what we are doing here. The reason, I presume, that led to this subject being selected for discussion at this Congress is the importance of the classroom, as that section of the school-building in which the scholastic portion of the teaching is carried on. Here the scholars spend practically all their school hours, and here their mental powers are put to the greatest strain, so that it is desirable that everything possible should be done to place them under the best physical conditions. The size of classrooms is obviously closely related to the subject of lighting, and is necessarily regulated by the size of the classes. These classes, as you know, vary from fifty to sixty scholars in a single class allowed in our elementary schools, down to fifteen to twenty scholars allowed in our secondary schools. The size is also regulated by the seating arrangements adopted, single seats taking more space than dual, the width of gangways and master's platform being also factors in the case. The purpose to which a classroom is put will also necessarily affect its size, but I am assuming that the classrooms at present under discussion are the ordinary ones in which general subjects are taken. That is to say, of course, I am not taking music and various other subjects which require altogether different conditions for their execution. The Board of Education in their rules—and the Board largely influence the schools which are erected in this country because they have practically the control of the plans—lay down an average of not less than 10 sq. ft. of floor space for each scholar in public elementary schools, and in this country this is generally adhered to, while in secondary schools, where single desks are used, a floor area of from 17 sq. ft. to 18 sq. ft. is required, though in certain circumstances a minimum allowance of 16 sq. ft. will now be accepted by the Board of Education. Given, therefore, the number of scholars to be provided, the above requirements fix the floor area of the classroom, but there still remains the comparative length, breadth, and height to be determined—matters in which the effective lighting and ventilation must largely depend. The breadth and length are to some extent governed by the type of seat employed, but the nearer the room approaches a square the better, with the limitation that a room can hardly be satisfactorily lighted if more than 24 ft. wide, while 22 ft. is much better. That is to say, with a room lighted from the side 24 ft. is quite the maximum in this climate under which the desks against the wall can be properly lighted. We will assume that the room is lit, as it should be, from one side only, which at once limits the depth from 20 ft. to 24 ft.; the length will then depend upon the number to be seated. The height of the room is also an important factor in the lighting, as the deeper the room the higher it should be if the seats farthest from the window are to be properly lighted. For the purpose of accoustics and ventilation 12 ft. is generally a sufficient height, though if a larger number are to be accommodated 13 ft. to 14 ft. in height may be necessary, the windows in all cases being carried close up to the ceiling. These regulations work out in this way. For a classroom to accommodate twenty-five scholars in a secondary school, you get a room 23 ft. 6 in. by 19 ft. and 12 ft. high, and this works out at an average area of 18 ft. per scholar. Having settled the size of the classroom, the question of lighting has to be considered more in detail. It seems hardly necessary to mention that it should be lighted from the left hand of the scholar only. I may say in passing that the room in which we are now meeting is not a classroom and was not built or intended for that purpose. The amount of glass area to be provided is more difficult to lay down. This will be affected by two considerations—the aspect and the situation. To take the latter first, it is obvious that a town school in a crowded part would not obtain so much light from a window of a given area with buildings opposite as a building situated in the open country with an unobstructed prospect. That is a thing

(*Continued on next page.*)

Fifty Years Ago.

FROM THE *Builder* OF AUGUST 15, 1857.

PROPOSED PURCHASE OF PREMISES FOR ARCHITECTURAL SOCIETIES.

OUR report last week of the proceedings at a meeting held to consider the proposed purchase of a house in Conduit-street, to be occupied by societies connected with architecture, has shown our readers that the Institute has entered warmly into the project, and are willing to become the tenants of part of the premises. The resolution come to by the Institute was this:—

"That this meeting, having received the resolution of the Premises Committee, communicated through the Council, hereby authorises the Council to prosecute such further negotiations as they may think fit with the proprietors of the premises, No. 9, Conduit-street, Regent-street, and, if it shall appear to the Council desirable, upon the further development of such negotiations, to enter into such an agreement as they may think fit, whereby the Royal Institute of British Architects may obtain for a term of years, on lease, the amount of accommodation shown upon the plans now exhibited, at a rent not exceeding 250*l.* per annum, with a premium not exceeding 500*l.* If, on the contrary, upon the further development of such a scheme, the Council shall decide that the termination of any such negotiations will be for the best interests of the Institute, they are hereby authorised to bring them to a close, reporting thereon at the next Special General Meeting.

That this meeting authorises the Council, in the event of their entering into any such contract as above referred to, to expend a sum of not exceeding 300*l.* for removal and fitting up the premises now brought under the notice of the meeting for the purposes of the Institute."

The Architectural Exhibition Committee will take another large portion of the premises; and, indeed, there seems little doubt of tenants enough at starting to pay a fair percentage on any fair expenditure for the house, if the matter be properly managed, as we have no doubt it will be. Under the Limited Liability Act, individual shareholders will run no risk beyond the amount they may subscribe for, and it is to be expected that all the shares will be taken by architects, who will thus become their own landlords. It is a good, roomy, sound house, well placed; and, under any circumstances, there seems to be so little risk of loss, that we may pretty confidently advise our readers to take shares, urging upon them that they may thus advance the professional *status* with every reasonable prospect of obtaining a fair return for their money.

Illustrations.

PROPOSED CANADIAN OFFICES, STRAND.

THE illustration is a slight sketch of Messrs. A. Marshall Mackenzie & Son's design for a block of office buildings for the vacant site in the Strand opposite St. Mary-le-Strand. The building measures 416 ft. to the Strand, and 176 ft. to each of the side streets. The design is conceived on a large scale consistent with the broad lines of the surrounding buildings of Somerset House, the Gaiety Theatre, and the Waldorf Hotel, and, the Strand front being crescent-shaped and colonnaded, will form a pleasing surrounding to Gibbs' beautiful church.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THESE sketches are given in connexion with the annual excursion of the Architectural Association—this year to Norwich and neighbourhood. A report of the proceedings, and some particulars of the buildings visited, will be found on another page.

WESLEYAN CHAPEL, WOODHALL SPA.—A new Wesleyan Chapel has been built at Woodhall Spa. The building is of red brick, with Bath stone facings, the roofs being covered with Staffordshire tiles. The internal dimensions are 51 ft. by 36 ft., and 50 ft. across the transepts. Seating accommodation is provided for 425 worshippers. The ceiling is boarded with pitch-pine, and supported on arched and panelled timbers. The walls are plastered, with stucco finish, and the glazing of the windows is in cathedral leaded lights. The outer angle of the front is occupied by a tower and spire. The cost is about 2,625*l.*, exclusive of the purchase of the site and architects' fees. The architects were Messrs. J. Wills & Sons, Derby, and the contractors, Messrs. F. M. Thompson & Sons, Louth.

INTERNATIONAL CONGRESS ON SCHOOL HYGIENE
(*continued from previous page*).

in which judgment must come in. The same applies in some degree to the aspect. Windows quite satisfactory for a northern aspect may be altogether unsuitable for a southern one. Classrooms should be so placed that they have only sun on them during part of the day, for they should not have sun on them all day. North, west, and south-west are, therefore, not desirable aspects for the window-side of the classroom. East and south-east, where they get the morning sun which passes off by the middle of the day, is much better. The rules of the Board of Education lay down that the glass area should be one-fifth of the floor-area of a classroom, and that is no doubt a good approximate idea of the amount of glass area to be provided, but, as I have said, it depends so much upon where the room is situated. If in crowded portions of our towns, it may be necessary to go to one-fourth of the floor area of that room, while in country districts very often one-sixth will be found sufficient. Anything beyond the amount of glass actually necessary to give a satisfactory light is undesirable, as it tends to make the room cold in winter and hot in summer, and adds considerably to the difficulty of the effective treatment of the room, both externally and internally. In all these questions we ought to consider the appearance of the building as well as its actual utility, for a school above all things ought to be pleasant to look on and pleasant to inhabit by the scholars themselves. A great deal of good is done by that as well as by using the building for its actual purpose. The glass line should not be more than 4 ft. above the floor, with the heads of the windows carried up as near the ceiling as possible. The windows should be so arranged in the wall that all the seats are equally well lighted. This is apt to leave the master's desk somewhat underlighted, and in order to rectify this Mr. Bell and I provided in the classrooms at Christ's Hospital at Horsham a small window to light the master's desk, kept low down, so that he can also see out of it, and I believe this has been much appreciated. Under no circumstances should there be windows facing the scholars, and windows in the opposite wall facing the master are almost equally objectionable. Mullions, transoms, and window-bars are, in my opinion, unobjectionable if the glass area is calculated independently of them. Plain sheet or plate glass is the best for glazing, and the view of the sky should not be shut out from the scholars. Glazed brick or tiled walls, except as dados, are not suitable for classrooms of the character we are considering, for the reflected light is trying to the eyes, and glazed bricks, being non-porous, are, I believe, considered by the medical faculty not suitable for crowded rooms. A white plaster ceiling is the best, with light green or grey walls according to aspect, the woodwork being painted white, or, what is better, being left its natural colour. A glare in a classroom is to be as carefully avoided as gloom. The artificial lighting of classrooms perhaps hardly comes under consideration to-day, but it is of equal importance where much evening work is done. Carefully regulated incandescent electric lighting is the best, and greatly simplifies the ventilation. Gas is better avoided. Perhaps the best illuminant is composed of inverted arc lights with a room lit by reflection from the ceiling, but it is extravagant in current. Single incandescent lamps equally distributed over the ceiling give a pleasant and well diffused light. Groups of lamps in electroliers should be avoided in classrooms. One eight-candle lamp, if not hung too high, should light sufficiently 24 ft. super. of floor area. For the ventilation of classrooms it is more difficult to lay down any definite rules, but the problem may be simply stated as follows:—The time required to contaminate the air in a classroom of an elementary school of the capacity required per scholar is eight minutes, while for that of a secondary school, which, of course, is nearly double the area, may be taken as a quarter of an hour. The temperature of the room according to the rules of the Board of Education, has to be kept at from 56 deg. to 60 deg. Fahr. In America they have it much higher. The problem, therefore, is how to change the air of a classroom from four to eight times an hour, and at the same time to avoid draughts and keep the temperature at from 56 deg. to 60 deg. In discussing ventilation it is not possible to exclude altogether the question of heating. This can be done by open fireplaces, hot water, or steam and warm air. In one set of regulations I saw for a large school for which plans were invited it was set out that the openings for the fireplaces were to be 4 ft. 6 in. to 5 ft. above the floor. I enquired of the eminent architect who made the requirement why he did so, and he told me he knew of a school where the fireplaces were of that height, and it had been found that the children got on extraordinary well in these rooms until they grew to be higher than the fireplace. When they got above that height they seemed to cease to progress and develop as they had done before, and the governors of that particular school had come to the conclusion that, thanks to the fireplaces being high and the ventilation of the lower portion of the room being so good, that accounted for the curious delay in the development of the children when they got above it. I do not express any opinion upon that theory at all, and I can only say when the school was built that regulation was not insisted upon. Still, there is, I think, undoubtedly in England a strong preference for the open fireplace and the open window, and no doubt there is much to be said for them, especially in small schools, but in larger ones I think it is impracticable. At the same time, I am strongly of opinion that an elaborate system of heating and ventilation such as may be very necessary in such buildings as Law Courts and hospitals is not necessary in a school for healthy boys and girls. The open fireplace not only provides heat, but also a means of ventilation. I think it preferably placed in the angle on the inner wall near the door, not on the window side, which is an outside wall, and which in such a position must place the unhappy master in a draught between the door and the fireplace. We pay so much attention to children in the school now, and very properly so, that I am inclined to think sometimes we forget the teachers, who certainly deserve attention quite as much as the children. An extract can be obtained by another flue in the chimney-stack and fresh air may be admitted at the back of the grate and from the corridor. By this means, however, it is impossible to ensure with any certainty a regular change of air in the classroom or an even temperature. All extracts which are worked by what are called natural causes are in my opinion unreliable, and under certain variable conditions of temperature or wind-pressure work uncertainly, and sometimes even in directly opposite directions to that intended. Of course, one of the great things I am sure is to air out the classroom between each class. To obtain results unaffected by these variations mechanical means must be employed in the shape of rotary fans or other contrivances, either to move the air by extraction or propulsion. If extraction is adopted, probably the best plan is hot-water radiators under the windows fitted with bafflers behind which the fresh air, admitted from outside, is warmed by passing over the radiators, and the foul air is mechanically extracted at the ceiling level in the wall opposite. By this means and with regulators on the inlets and outlets the system can be sufficiently regulated, but it is as well also to supply an open fireplace, though the mechanical extract may interfere with its draught at times. The size of both the inlet and outlet depend upon the power of the fan employed. The alternative is the propulsion of warm air into the room by a fan, the air being admitted into the room about 2 ft. below the ceiling, and the outlet being at the floor level into the corridor immediately below the inlet over. The advantages of this system are the more equal distribution of the heat throughout the room, the absence of all heating apparatus, such as radiators, in the room, the avoidance of draught through the air in the room being under slight pressure, and the ease with which the apparatus can be used for ventilating purposes in summer-time. The system requires to be planned with the building, and cannot therefore well be applied to old buildings. Each system, however, has its advantages according to the size and special circumstances of the building, and with mechanical means now so readily at our disposal there should be no difficulty in providing either the temperature or change of air that our medical advisers may decide from time to time to be necessary or advisable, for after all we must look to the medical profession to lay down the hygienic requirements of the children to be accommodated to these rooms, which it is the architect's humbler but equally necessary part to see carried out as effectually and economically as possible."

The last sitting of Section XI. was held on Thursday.

The Internal Arrangement and Equipment of Secondary Schools.

Mr. Jas. Graham, in a paper on the "Internal Arrangement and Equipment of Secondary Schools," described the West Leeds High School which is being erected by the Leeds Education Committee. The school is the outcome of visits to the leading schools in this country and on the continent. The site extends to some 40,000 yds., and the school building itself takes up 2,000 yds., is four stories high, provides accommodation for 600 pupils, and consists of a basement and three other floors. The school is on the central corridor system. Separate departments for boys and girls for ordinary teaching are provided, and the special rooms are so arranged that they may be used by either boys or girls without intermixing. On the basement floor are physical, chemical, and botanical laboratories, lecture-rooms, preparation-rooms, etc., electrical, mechanical, and wood handicraft rooms, with room for technical drawing. There is also a refectory for boys and girls, with kitchen between them. On the ground floor there are ten classrooms (five for boys and five for girls), with assembly-hall, principals' rooms, and waiting-rooms, etc., are arranged in the central section. On the first floor there are ten classrooms, with a room for special subjects, and a library so arranged that it is equally accessible from both boys' and girls' departments. On the second floor there are domestic science, sewing, dress-making, and art rooms. On the roof flats are arranged for science teaching, and there is also a conservatory for practical botany and for growing plants for art study. Separate front and back entrances are provided for boys and girls. The back entrances are opposite those of the front; all the entrances give easy access to the main corridors, from which all rooms are directly entered. Close to the entrances on the ground floor the cloak-rooms and lavatories are situated for junior pupils, and on the first floor cloak-rooms and lavatories are provided for the senior pupils. All the floors throughout the buildings are wood blocks polished. Common rooms for the teachers are placed on the mezzanine floor on the south side of the building overlooking the playing-fields, and lavatories, etc., for the use of the teachers have been provided close to these rooms. The staircases are spacious and roomy, having a width of 10 ft. They are open, and have a central well, guarded by an iron rail with blunt spikes. In each staircase the steps are arranged in short flights of eight steps. The main landings are at least 6 ft. wide, while the intermediate landings are about 3 ft. wide. Each step is 6 in. high and 12 in. wide. The assembly-hall is 55 ft. by 35 ft., and 16 ft. high. The corridors run from end to end of the building, and are divided into two about the middle by a glass partition which separates the boys' from the girls' departments. The corridors are 16 ft. high and 10 ft. wide, and are lighted from the ends and from the sides through the glass partitions of the classrooms. The walls to the dado line are tiled with artistic tiles, and above this line the walls have been treated with the smooth impervious Parian cement, which will be covered with paint of a light colour. The corridors are heated by hot-water (low-pressure) radiators. Each classroom is separate from the other, and the window-wall contains three windows, 15 ft. of the 25 ft. wall length being glazed. Each window reaches above to within 3 in. of the ceiling and below to within 4 ft. of the floor. The windows throughout are glazed with clear sheet glass. The natural system of ventilation has been adopted, and the windows are made to open, both above and below. The walls of the classrooms will

be painted a delicate shade of green, grey, or yellow, and the surface will be flat. Mr. Graham proceeded to deal with the furniture in the school.

Sanitary Appliances for Schools.

Dr. Charles Porter (Assistant Medical Officer and Chief Insptctor of Nuisances for Leeds), in a paper on this subject, remarked that many education authorities and school architects seemed to adhere to the old-fashioned idea that if places for the deposit of excrementitious matters are provided all that is necessary has been done. Removal of such matters from the school building as rapidly as possible is regarded as only of secondary importance. In new elementary and even secondary schools, therefore, the favourite type of convenience is still the trough latrine placed in a compartmented outbuilding. The task of impressing on authorities the necessity first of introducing chain-pull closets for the use of children, and later of placing the conveniences in the building itself will be no easy one. The objections certain to be raised are that pedestal closets are expensive to introduce, costly to maintain, and wasteful of water, and that the majority of the children are so rough that they will injure anything but a trough, and that nuisance will arise. As to expense, the difference between the cost of the improved trough and a series of pedestal closets is not great, and it does not seem likely that the cost of maintenance will be more. As to waste of water, observation in Leeds has shown that instead of a waste there would be actually a saving of water and a diminution in expenditure if the charge is made by meter.

In the discussion which followed, the trough closet was very generally condemned.

Heating and Ventilation of School Buildings.

Discussing this subject, Mr. W. Wilson Haden, M.I.M.E. (Trowbridge), said that there are few factors in the economy of a school building of greater importance than the provision of a healthy and comfortable atmosphere, and it is much to be regretted that there is a strongly marked tendency on the part of some architects and committees to underestimate the importance of careful attention to this feature, as is seen in the very general starving of this branch of the work in favour of the decoration and adornment of the building, and other features, which, though of secondary importance, appeal more strongly to the eye than the hygienic requirements. As heating engineers, they were far from claiming that the last word has been said either in heating or ventilation, but they did claim that they were now both able and prepared to fulfil with certainty the requirements which have as yet been formulated by the medical profession. Further advances would be made in the joint sciences of heating and ventilation if the medical profession would specify explicitly the hygienic features of an ideally healthy building. Mr. Haden proceeded to discuss the "Plenum," "Vacuum," and other methods of ventilation and heating, and held that the important and absolutely essential point for the hygienic success of the "Plenum" and similar methods is that the air ducts shall be so constructed that they can be thoroughly cleansed in every part, and it is equally essential that the ducts when constructed shall be thoroughly cleansed at regular intervals. The approximate relative cost of heating schools by fires with such ventilation as would be obtained by windows would be 1·5 shillings per head per annum. The cost of heating by radiators or pipes with natural ventilation with two or three interchanges per hour would be ·99. The cost of heating by a "Plenum" apparatus with eight to ten changes per hour would be 1·48 shillings, including electric current for driving fan at 2d. per unit.

Mr. D. Barclay, F.R.I.B.A. (Glasgow), followed with a paper on the same subject, in which he gave his experience from the erection of about fifty schools. He dealt with the general problems of school ventilation, and recommended the Govan schools as models of the "Plenum" system, remarking that he had visited all the most important college and university buildings in the country and had not found that any compared with them for efficient heating and ventilation. He proceeded to give a short comparison of various methods and discussed forms of roofs, outlets, fans, and screens, and to sum up he considered that the only defect which could be alleged against the "Plenum" system was the small amount of pressure upon the air, which is if anything the opposite of enlivening to those living in its influence. The extraction system is, he believed, exhilarating. He should say, therefore, that where it can be done it would be most desirable to combine the two systems, and have both the "Plenum" fan and the extraction fan. In ordinary cases where it is not thought worth while to purify the air he would consider that the admission of fresh air through radiators is the cheapest and simplest method provided the outlets are arranged in the way he had already mentioned. Another small point that should be noticed is that care should be taken that the air current entering the room be not directed against the side of a cross-beam on the ceiling. Many an apparatus has been condemned because a cross-beam in such a position has been sending a down draught on the head of a teacher or some other occupant and the true cause of the defect has escaped notice.

After a short discussion, the Section concluded its sittings.

INTERNATIONAL HOUSING CONFERENCE.

THE eighth International Housing Conference resumed its sittings at Caxton Hall, Westminster, on Wednesday in last week.

Town Planning.

Dr. Stubben (Berlin) read a paper on "Town Planning," in which he showed how bad planning of streets and building estates in the past has led to the creation of slum areas which have now to be cleared and reconstructed at enormous expense. In Germany, without excluding the interests of private individuals in town development, they are subordinated to the public needs. The construction of cheaper streets is a vital question for working-class residential sites. Health must be provided for by an adequate supply of light and air through wide streets or public open spaces in front of the dwellings. These should take up at least one-tenth of the land. The author proceeded to advocate that the public parks should be connected, if possible, by shady boulevards, and beauty should be secured by the direction and advice of the artist. Districts could be mapped out for special kinds of building, *i.e.*, factories, villa residences, working-class dwellings, isolated or semi-detached houses, and dwellings of various heights or arrangement. The chief parts of the execution of a town plan consist in :—(*a*) Limits on building; (*b*) compulsory taking or laying down streets and building lines; (*c*) rearrangement of plots of land; (*d*) allocation of certain districts for factories.

Transit.

Professor E. Maheim (Liege), in a paper on "Transit," pointed out that Belgium is a densely-populated country of small houses well supplied with means of communication which have enabled workers in large industrial establishments to reside in rural districts. This has largely checked the growth of the block system, and kept down excessive prices for land by bringing new possible housing sites on the outskirts into the field, and thus lowering the economic rent at the centre. He expressed the opinion that cheap fares in Belgium have stopped the depopulation of rural districts, and the congestion of towns in a very large measure.

Rural Housing.

Miss Constance Cochrane discussed the question of rural housing, and put forward a number of remedies which, in her opinion, would stop the depopulation of our villages. She advocated the creation of small holdings, and said the provision of large gardens surrounding cottages would enable a higher rent to be paid, and would obviate the necessity of drainage. A certain number of cottages could also be built in many villages to let at a commercial rent to those slightly above the labouring class, thus indirectly helping to relieve the pressure. Where there is a distinct public need and land cannot be obtained otherwise, it should be acquired by an impartial central authority who would also insure that the price paid was a fair one. It was now very generally considered that the State should lend money for cottage building at such a rate of interest as would cover expenses only, and for an extended period. Miss Cochrane further advocated independent inspection of cottage property by a central authority, and reforms in the administration of the Health and Housing Acts.

M. E. Tribaut described the system of small holdings in Belgium.

This concluded the proceedings of the Congress.

Builders' and Contractors' Column.

THE CORROSION OF STEEL IN CINDER CONCRETE.

IN view of the divergence of opinion as to the liability of steel to corrosion when embedded in cinder concrete, and the paucity of authoritative data on the subject, a systematic investigation was undertaken a few months ago by Mr. William H. Fox, of Vermont, at the Thayer School of Civil Engineering, U.S.A.

For the purpose of the investigation, twenty prisms of concrete were made, each measuring 9 in. long by 4 in. square, and containing three pieces of steel, the ends of which were allowed to project slightly so that it should be easy to compare the corrosion of the exposed metal with that covered by concrete.

The same quality of Portland cement was used throughout, mixed with sand and cinder in four different proportions as follows :—

(1) 1	part cement,	1	part sand,	3	parts cinder.
(2) 1	,,	2	,,	5	,,
(3) 1	,,	2½	,,	5	,,
(4) 1	,,	3	,,	6	,,

Further variations were introduced by using different proportions of water, and by adopting different methods of treatment in the course of moulding. Thus, the three undermentioned kinds of test specimens were obtained from each class of concrete :—

(1) Dry and tamped.
(2) Wet and untamped.
(3) Wet and tamped.

The exact proportions of water are not stated in the form of percentages, but a general indication is given by the remark that the dry mixtures were of such consistency that water only flushed to the surface after vigorous tamping, and that the wet mixtures were so moist that water flowed from them continuously during the process of mixing.

As the word "cinder" seems to be employed in the United States to designate any form of coal residue, it should be explained that the aggregate used for making the concrete for these tests consisted of clinker from the heating apparatus boilers of the Thayer School. The coal burned is said to be of good quality, and containing only a trace of sulphur. The clinker was passed over a ¾-in. mesh screen to exclude all dust.

The test pieces of steel, 5 in. long by 1-16 in. square, were ground bright on an emery wheel before being inserted in the moulds, and were placed transversely to the axis of the prisms, the ends of each strip projecting ½ in. beyond the surface of the concrete.

Having been allowed to stay in the moulds for twenty-four hours, the prisms were removed, and a collar of neat cement was formed around each projecting strip of steel as a safeguard against the penetration of water save through the body of the concrete.

Some of the specimens were inserted in a steaming-chamber for twelve hours every day for two weeks, and afterwards exposed to the air; the others were alternately soaked in water and allowed to dry in the air for about five weeks.

As the rise of air bubbles denoted the presence of voids in the case of specimens soaked in water, Mr. Fox made a determination of the quantity of moisture absorbed during the first forty-eight hours. The results are stated in the subjoined table :—

Consistency and Treatment.	Weight of Water Absorbed.
Dry tamped	2·2 per cent.
Wet untamped	3·0 ,,
Wet tamped	4·5 ,,

Proportions of concrete, 1 : 1 : 3.

Consistency and Treatment.	Weight of Water Absorbed.
Dry tamped	3·6 per cent.
Wet untamped	6·5 ,,
Wet tamped	2·7 ,,
Proportions of concrete, 1 : 2 : 5.	
Dry tamped	5·1 ,,
Wet untamped	5·9 ,,
Wet tamped	2·8 ,,
Proportions of concrete, 1 : 2½ : 5.	
Dry tamped	4·3 ,,
Wet untamped	7·8 ,,
Wet tamped	6·2 ,,
Proportions of concrete, 1 : 3 : 6.	

With one exception, these results indicate the advantage secured by tamping wet mixtures of cinder concrete with the object of reducing the proportion of voids. Another reason for the adoption of tamping revealed the fact that in the test specimens which had not been so treated the sand and most of the cement had settled to the bottom of the moulds, and the aggregate, with a thin coating of cement, had risen to the top. As stratification of the kind is due to the different specific gravities of the constituent materials, it must be still more marked in the case of stone and gravel concretes, and, as practical men are well aware, is exceedingly likely to occur in the moulding of concrete-steel columns unless suitable precautions are taken. In the case of cinder concrete the effect is to afford somewhat improved protection of steel in the lower part of a beam or other horizontal member, and to leave any metal in the upper part practically unprotected, for even the advocates of cinder concrete admit that steel embedded therein can only be preserved from corrosion if adequately coated with cement.

After treatment in steam, water, and air for about forty days, all the prisms were broken up and the embedded steel was carefully examined. The result in every case but one was that the steel showed spots and streaks of rust, the extent to which corrosion had proceeded having been apparently the same for all the specimens, notwithstanding the different proportions, consistency, and treatment of the concrete. The one exception was a prism made of 1 : 1 : 3 concrete mixed dry and tamped into the mould, and in this instance all three strips of steel appeared perfectly free from rust. Of course, it would not be possible to draw any general conclusion from a solitary result such as this, but the reasonable inference is that a rich mixture thoroughly tamped may possibly afford adequate protection for embedded steel. This is a matter clearly demanding further inquiry, and until that has been made it is not safe to assume that cinder concrete can be regarded as a rust-proof material.

POST-OFFICE BUILDINGS AND REINFORCED CONCRETE.

Mr. Whitehead (Essex, S.E.) asked the First Commissioner of Works in the House of Commons on Friday last week whether post-office buildings, other than the General Post Office, are being constructed, or are about to be constructed, of reinforced concrete; and, if so, how many, and where; whether the estimates for any post-office buildings show any material economy compared with post-office buildings erected with ordinary materials; and, if so, what is the extent of the saving, approximately, per cubic foot of building. Mr. Harcourt, in a printed reply, said:—The other buildings being constructed, or about to be constructed, of reinforced concrete are the Manchester principal sorting office; Birmingham, store building; London, Western District Post-office. The approximate savings are 20 per cent.

THE TRIBUNAL OF APPEAL:

SPINK & SON *v.* LONDON COUNTY COUNCIL.

WE have received from Mr. Martin L. Saunders, architect for Messrs. Spink, who were the appellants in the Tribunal of Appeal case reported at considerable length in the *Builder* of August 3, a copy of the official award of the Tribunal, and we print the conditions below. It will be seen that although the purport of the award is the same, the wording differs materially from the decision reported in the *Builder*, which was taken down at the time by our reporter and verified by him from the document read by the Chairman.

The official award reads as follows:—

"We do hereby allow the appeal upon the following conditions, viz.:—The appellants shall execute the following works in or about the said building:—

(1.) An iron ladder to be provided and fixed in position at the southern end of the roof, so as to afford safe and easy access to the roof of the adjoining building.

(2.) The windows on the fifth floor next the front to be arranged so that persons may readily pass through at sill-level, and guard-rails to be provided to the front edge of the flat outside these windows. Another iron ladder to be provided and fixed at the southern end of the said flat to afford access to the ladder previously described.

(3.) The staircase to be separated from each of the floors by a solid incombustible partition carried up from floor to ceiling, with doorways as shown on the said plans, the doors between the rooms and the staircase to be solid hard wood of not less than 1¾ in. finished thickness, and made self-closing by means of metal springs or rising butts, any glazing in the doors or partitions to be of fire-resisting quality.

(4.) The doors across the exit passageway on the ground floor to be made self-closing, and to be kept free of fastenings and hung to swing both ways, as shown.

(5.) The door between the ground floor and the exit passageway to be made self-closing by means of rising butts.

(6.) The doors from the exit passageway to the street to be either locked back against the wall fully open during the time persons are employed upon the premises, or else hung to open in the direction of exit clear of the footway and fastened only with automatic butts if fastenings be required during such period.

(7.) The lift machinery to be enclosed, as shown, with 2 in. hard wood partition.

The parties to be at liberty to apply to us as to the due and proper compliance with the before-mentioned conditions.

Further, we make no order as to costs."

By a printer's error, the premises of the appellants were described as 162, instead of 1 and 2, Gracechurch-street.

Architectural Societies.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The last of the series of four lectures at the architectural exhibition in the rooms of the Royal Scottish Academy was given on the 9th inst. by Mr. Ramsay Traquair, A.R.I.B.A. The subject of the lecture was "The Church of Santa Sophia and the Imperial Mosques of Constantinople." The church was fully described by Mr. Traquair, as were also the mosques, which, the lecturer said, were built by the Turks after the Turkish Conquest on the model of Santa Sophia. Mr. Traquair went on to describe the rise of the Byzantine style, and its culmination in Santa Sophia; and he afterwards showed on the screen some examples of the Persian tiles used to decorate the buildings. A series of views of buildings in Constantinople concluded the lecture, for which Mr. Traquair was cordially thanked by Mr. Hippolyte J. Blanc, who occupied the chair. Sir Thomas Gibson Carmichael, in supporting Mr. Blanc, said he could only hope with regard to some of the buildings recently erected in Edinburgh that they were more charming inside than outside. To Mr. Blanc he moved a vote of thanks for the splendid manner in which he had organised the exhibition. Mr. Blanc, in acknowledging the vote of thanks, referred to the excellent way in which the secretaries and the committee had carried through the work connected with it. The advantages of such an exhibition to the citizens of Edinburgh could not, he said, be measured in pounds, shillings, and pence.

Archæological Societies.

SURREY ARCHÆOLOGICAL SOCIETY.—The annual summer excursion of the Surrey Archæological Society took place a short time ago. Leaving Guildford Station, the party first proceeded to Merrow, where the church and the Horse and Groom Inn, dating from the XVIth century, were inspected. The former was described by Mr. Philip M. Johnston, and the latter by Mr. Ralph Nevill. West Horsley Church was the next stopping-place. Mr. Johnson dealt with its history and distinctive features. From thence, the party proceeded to East Horsley Church, the interesting features of which were explained by the rector. The next building visited was West Horsley Place, the residence of Mrs. Fielder, and was described by Mr. H. E. Malden. East Clandon Church, rather more than a mile away, was then visited. It was completely restored a few years ago, but Mr. F. B. Eastwood described the several points of interest, and his remarks were supplemented by some notes on the recent restoration by Mr. T. G. Jackson, R.A., F.S.A. From here the party drove to West Clandon, and inspected the church there. Its particular features were explained by Mr. Johnston. The party afterwards repaired to Clandon Park, where, by the kindness of the Earl of Onslow, they were entertained to tea. Several rooms on the ground floor were also thrown open for inspection, and Mr. Ralph Nevill briefly described several interesting features. He also explained that Temple Court, close by the residence of Mr. A. H. Bowles, was the home of the Knights Templars of old. This concluded the day's proceedings, and the party joined the brakes, and drove back to Guildford.

SUFFOLK ARCHÆOLOGICAL SOCIETY.—The members of this Society held their annual excursion on the 31st ult. The main body of the party started from Ipswich by train for Halesworth, which was reached an hour later, and thence in brakes to Mettingham Castle. The grounds of Mettingham Castle were thrown open to the visitors by the owner, Major H. Ross-Johnson. There have been two castles at Mettingham, the first dating back to early Norman days, and when the latter castle was built, the discarded buildings were used as a college for priests. Permission was given to John de Norwich to fortify his manor house at Mettingham about 1344, and it was mentioned by Mr. Redstone that in 1381 the castle was attacked by Jack Straw's insurgents, who obtained possession of it, and, ransacking it, took away money and valuables to the amount of 1,000*l*. Mr. Redstone believed that it was the second castle that was taken on that occasion, as the older one had been more strongly fortified. From the castle the party drove to Mettingham Church, and the Rector, Rev. H. E. Bucke, showed the visitors round the church. After luncheon at the King's Head, Bungay, a visit was made to Bungay Castle, the remains of which are to be found at the back of the King's Head, and virtually form part of the grounds of that hostelry, and also to St. Mary's Church, which formerly adjoined a priory of Benedictine nuns founded in 1160. The nave, south aisle, and chancel were supposed to have been built about 1300, the north aisle in 1450, and the western front and tower somewhat later. In 1688 a fire in the town committed great havoc, including the destruction of the chancel, which, with the priory, remains a ruin, and the church now has no chancel in the ordinary form. The party then proceeded to the Drill Hall, where they were entertained to tea by Mrs. Fetzer Taylor, of Hedenham Rectory. Before leaving, thanks were tendered to Mrs. Taylor, on the motion of Mr. H. C. Casley, seconded by the Rev. F. J. Eld. The last item in the day's programme was the visit to Flixton Hall, where the members of the party were allowed to inspect the principal rooms, by permission of Sir Frederick E. Shafto Adair.

WORCESTER DIOCESAN ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—On the 30th ult., Grosmont, Kentchurch, and Garway, were visited by members of this society. Journeying by train to Pontrilas, the party were conveyed by brakes to Grosmont. Here the interesting church and castle were inspected. The former has a large disused nave. The transepts and choir have been restored, and are separated from the nave by a glass screen. The vicar of the parish (Rev. C. Wesley) acted as guide to the party, both at the church and at the castle, close by. The castle is a ruin, the remains consisting principally of the gateway and baronial hall. Kentchurch Church and Court were next visited. The former building is to a considerable extent new, having been built circa 1824, by Nash. Kentchurch Church has been rebuilt, and is of interest, as containing many curious monuments to the Scudamore family. From Kentchurch, the

party drove to Garway, and inspected the church there. The tower of this church is detached, and is placed at an angle to the main building, being connected with it by a short passage. The church has much Norman work, and is specially noticeable on account of the chancel-arch. Close to the church is the most ancient dovecote in Herefordshire, with accommodation for over 600 birds. The dovecote is of the XIVth century, and has an arched doorway on its south-west side. It was built by the Hospitallers, who succeeded the Knights Templars in the occupation of Garway. The party afterwards returned to Pontrilas, and after tea they returned to Worcester, which was reached at 9.30.

MONMOUTHSHIRE ARCHÆOLOGICAL SOCIETY.—Members of this society recently visited Llangibby Church, to view the discoveries which have been made there, and to see the condition of the building which is undergoing restoration. Accompanied by the President (Lord Tredegar), they paid a visit to the church, where, in the unavoidable absence of the rector, they were met by Mr. Harold Addams Williams, churchwarden, and Mr. W. H. D. Caple, of Cardiff, the architect for the restoration. The architect dated the church as an early XVth century building, which, he said, probably replaced an earlier church. He described the proposed restoration work and the serious condition of the walls and roofs, and pointed out various matters of interest which investigations had brought to light. These included a walled-up ancient window on the south side of the chancel, and paintings on the walls of the nave and over the chancel-arch. Beneath a thick covering of white lime good worked stone had been found around the window openings. The chancel-arch, all thickly covered with lime and plaster, had been found to be in a dangerous condition, and very serious fractures not before suspected had been discovered covered up in the same way.

Competition.

BETHNAL GREEN MUNICIPAL BUILDINGS COMPETITION.—The Borough Council having modified clauses 4, 7, and 10 in the instructions to competitors in accordance with the views of the President of the Royal Institute of British Architects, he has now appointed an assessor in this competition.

BOOKS RECEIVED.

TORQUAY AND ITS SURROUNDINGS. By Percival H. W. Almy, with a foreword by Eden Phillpotts. (London: The Homeland Association, Ltd., 22, Bride Lane, Fleet-street, E.C. 1s. and 2s.)

PATON'S LIST OF SCHOOLS AND TUTORS. Tenth Annual Edition. (London: J. & J. Paton, 143, Cannon-street, E.C. 1s. 6d.)

THE MODERN PLUMBER AND SANITARY ENGINEER (Illustrated). By sixteen specialist contributors, under the Editorship of G. L. Sutcliffe, A.R.I.B.A. Divisional Vol. III. (London: The Gresham Publishing Company, Southampton-street, W.C.)

WALL-PAPER DECORATION (Illustrated). By Arthur Seymour Jennings. (London: The Trade Papers Publishing Company, Ltd., Birkbeck Bank-chambers, High Holborn.)

STEEL: ITS VARIETIES, PROPERTIES, AND MANUFACTURE. By W. H. Greenwood, F.C.S., M.Inst.C.E., etc. Revised and Rewritten by A. Humboldt Sexton, F.I.C., F.C.S. (London: Cassell & Co., Ltd. 3s.)

IRON: ITS SOURCES, PROPERTIES, AND MANUFACTURE. By W. H. Greenwood, F.C.S., etc. Revised and partly Rewritten by A. Humboldt Sexton, F.I.C., etc. (London: Cassell & Co., Ltd. 3s.)

MUNICIPAL BATHS, ETC., LOWER SYDENHAM.—The baths and conveniences which have been erected by the Lewisham Borough Council at Bell-green, Lower Sydenham, have now been opened. The buildings have been erected at a cost of about 2,800*l.* by Messrs. Potter Bros. & Haslam from the designs of the Borough Surveyor, Mr. E. Van Putten, the material used exteriorly being brown glazed and red bricks. The structure affords lavatory accommodation for both men and women, and doors at each side give entrance, respectively, to the men's and women's baths, six in each case. The interior is finished with glazed bricks, and the baths are porcelain.

Trade Catalogues.

Messrs. J. Sagar & Co., of Halifax, send us their catalogue of wood-working machinery, a well-bound volume of nearly 400 pages, giving illustrations and general information relative to machines for sawmill proprietors, builders, joiners, cabinet-makers, railway and tramway carriage builders, wheelwrights, and engineers' pattern-makers. In addition to the more familiar kinds of machinery, the catalogue includes particulars of the most up-to-date appliances, such as chain-cutter and hollow-chisel mortising machines, sand and glass papering machines in considerable variety, fluting and copying machines, and many others that cannot be mentioned in detail. The volume is an excellent epitome of modern wood-working machinery, and is produced in a form rendering it convenient for the bookcase and for the purposes of reference.

We have received from the Trussed Concrete Steel Company a neat little pamphlet containing instructions regarding materials and workmanship for superintendents and inspectors of reinforced concrete work in accordance with the Kahn system. The issue of this book is very opportune at the present time when reinforced concrete is coming into extensive use in architectural and engineering practice. Almost without exception, the failures reported in the United States and on the Continent have resulted from the carelessness of workmen and the laxity of superintendents. We presume the average workmen will always be more or less indifferent as to the quality of the work performed, although quite willing to discharge his duties properly if under efficient supervision. The pamphlet to which we now refer has been written with the special object of conveying clear and precise instructions to building superintendents, and from a perusal of its contents we are sure that if the instructions therein given are conscientiously followed, the execution of properly designed works on the Kahn system will be attended with satisfactory results to all concerned. The usefulness of the pamphlet for general reference is increased by a well-arranged index at the end.

Correspondence.

THE FLÈCHE AT AMIENS.

SIR,—Your readers, myself among them, will be grateful for the drawings of the Flèche at Amiens, which I have ascended and examined more than once with very considerable interest and delight.

When I first opened my *Builder* of August 3 my impression was that it had once again been *measured*; your letterpress sets that point right, but a *plan*, which here is somewhat unusual, and a few sections would greatly add to the usefulness of Mr. Pearson's work for the purpose of study to those who do not know and prize Burges's book; the racy note on his drawing as to a dimension, for which he paid a high price to a Frenchman, shows his great thoroughness in all that he did.

There are drawings of it in Viollet-le-Duc's "Dictionnaire," but to my mind the quaint figures and centaur-like animals, so full of character, as also the details of every portion of it, are well worthy of a whole series of photographs, if such are obtainable. Seen only from below its alleged height of 422 ft., or 18 ft. higher than the spire of Salisbury Cathedral, is readily doubted, but this is more fully realised by those who look *down* from it.

As a masterpiece of framing and stability, to say nothing of its wondrous beauty, it has few if any rivals; the modern ones of Notre Dame, Paris, and Cologne Cathedral in some way seem to miss the charm of it.

E. SWINFEN HARRIS, F.R.I.B.A.

PRIORY OF ST. JOHN AT CLERKENWELL.

SIR,—In your interesting account of the Priory of St. John at Clerkenwell, July 6, there is a curious error which states, "the priory to which the Knights Hospitaller succeeded after its forfeiture by the Knights Templar."

Surely it is common knowledge that St. John's was never Templar property, but was built by the Hospitallers in the XIIth century. The Hospitallers did succeed to the Temple after the suppression of the Templars, but this was not St. John's.

The fragments of Prior Docwra's monument recently discovered, although slight, are of considerable interest, consisting of richly carved finials, fragments of mouldings, and several spandrils, containing Docwra's badge. These fragments will be carefully preserved in the museum in the north chambers of the ancient crypt, where there are already many fragments of wrought and carved stone which help to indicate the former grandeur of the chief house in Britain of the Knights of St. John of Jerusalem.

H. W. FINCHAM,
Churchwarden, St. John's, Clerkenwell.

[*** The passage referred to is inaccurate. The Knights Hospitaller succeeded to the forfeited property in London of the Knights Templar some while after they settled in Clerkenwell.—ED.]

The Student's Column.

MODERN METHODS OF USING GAS.—VI.

Factory Lighting.

DUST AND SHOCKS.—For many years it was commonly believed that the fragility of gas mantles and the evil effects of dust in incandescent burners would prohibit the use of incandescent gas lights in such factories as metal foundries, cotton mills, and machine shops, and in all places subject to severe vibrations or concussions or filled with an atmosphere heavily laden with dust particles. All difficulties have, however, been surmounted by the use of anti-vibration devices and dust-protectors.

Fig. 11. *An Anti-vibrator and Factory Lamp.*

Anti-vibrators.—Gas mantles fitted on rigid burners and subjected to severe shocks have as a rule very short lives, and in most factories and warehouses it is desirable to support each burner upon a resilient device which will allow the burner to have a certain freedom of motion and act as a buffer between the burner and the rigid supply pipe. A considerable number of devices to accomplish the object in view have been invented, and they are commonly known as

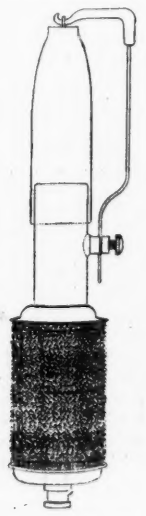


Fig. 12. *Burner with Dust-protector.*

Fig. 13. *A Foundry Lighted with High-pressure Gas.*

"anti-vibrators." A simple anti-vibrator and factory lamp, which has been fitted in many factories by the James Keith and Blackman Company is shown in Fig. 11, but it will readily be seen that there are other ways by which the mantle can be protected from injury by shock.

Dust Protectors.—In some factories the air is laden with dust. The air inlets of the Bunsen tube of an incandescent burner enable dust to enter and accumulate in the tube, and the mixture of gas and air which flows to the head of the burner ceases to have the composition required for efficient lighting. Burners exposed in dusty situations may with advantage be encased in gauze protectors, but it is necessary to periodically clean the gauze. A Keith burner and dust protector is shown in Fig. 12.

High-Pressure Gas for Factories.—High-pressure gas installations are particularly suitable for factories, and the initial cost of the compressing plant and high-pressure burners is soon balanced by the sum saved by using high-pressure gas in place of low-pressure gas. At Woolwich Arsenal the machine-shops have for some years been lighted by a high-pressure system introduced by Sale & Onslow; and a great number of private factories are now using the Keith system or the Sugg system of high-pressure lighting. A gas-compressing plant was shown in Chapter III.

The intensity of light required in factories varies so greatly in each individual case that

Fig. 14. *A Pattern Shop with Anti-vibration Gas Fittings.*

Fig. 15. *A Tailor's Factory Lighted with High-pressure Inverted Burners.*

it would be useless to state a rule by which the quantity of light to be allowed for every foot of floor space might be calculated.

The following reproductions of photographs of factories lighted by the Keith high-pressure system illustrate the diverse conditions under which high-pressure gas is being used. Fig. 13 shows a foundry lighted with high-pressure gas; Fig. 14 shows a pattern-shop with anti-vibrators; and Fig. 15 shows a tailor's factory lighted with high-pressure inverted gas lamps which have taken the place of electric lamps.

Obituary.

HERR HERMANN ENDE.—The *Morning Post* announces the death at Wannsee, near Berlin, of Herr Hermann Ende, the well-known architect, and until recently President of the Berlin Academy of Arts. Herr Ende designed many of the principal and private buildings in Berlin and the provinces as well as various important national buildings erected by the Japanese Government in Tokio.

General Building News.

ST. JOHN'S CHURCH, GLASTONBURY.—Funds are now being raised for the purpose of completing the restoration of this church. The restoration of the tower has already been completed, as well as the walls which flank it, but now at the east end of the church there have been some serious settlements, which have resulted in the buckling of the north chancel arch and pillar. Shoring has, so far, prevented any fresh movement. The scheme includes the provision of vestry accommodation. The vestries will consist of a sacristry abutting on the eastern wall of the north choir aisle, and the opening up of a closed doorway will give direct entrance into the sanctuary itself; whilst on the northern side of the choir aisle a large choir vestry will be built, which will be available for choir practices, etc. The work will be under the guidance of Messrs. Caröe & Passmore, architects to the Ecclesiastical Commissioners.

MISSION CHURCH, NEW BOLSOVER.—On the 2nd inst. the Duchess of Portland visited New Bolsover and laid the corner-stone of a mission-church which is being erected there. The building consists of porch, nave, chancel, vestry, heating chamber, and store. Accommodation for 200 worshippers will be provided. The building is of brick, with stone dressings. Messrs. C. Rollinson & Sons, Chesterfield, are the architects, and Messrs. Collis & Sons, Chesterfield, are the builders.

EPPING PARISH CHURCH.—Building operations have just commenced for the completion of the new parish church of St. John the Evangelist, in this village. The cost of building a north aisle and porch has been estimated at 2,100*l.*, and in addition a tower to cost 6,108*l.* is being erected. The work is being carried out to the designs of the original architect, Mr. G. F. Bodley, R.A.

NEW CHURCH, EPSOM.—The Duchess of Albany visited Epsom on the 3rd inst. for the purpose of laying the foundation-stone of the new parish church. The scheme is to build the new church in two sections on the site of the present edifice, and the section at present being built is the east end, and will include the sanctuary, the choir, and two bays of the nave. When this section has been completed the demolition of the old church may be undertaken as a preliminary to the building of the remaining portion of the new fabric. The total inclusive cost of the work at present in hand is estimated at about 9,000*l.* The architects are Messrs. Nicholson & Corlette, the contractors being Messrs. Benfield & Loxley.

CHURCH RESTORATION, SOUTHHOLT.—The old parish church of Southholt has just undergone restoration, which was rendered necessary partly by a settlement of the east end and arch-way. The work has been carried out by Messrs. Hawes & Sons, of Norwich, under the direction of Mr. E. F. Bisshopp, the Diocesan Architect, of the firm of Bisshopp & Cautley, Ipswich.

NEW SCHOOL, CHADWELL HEATH.—A new school, known as Whalebone School, has been erected by the Dagenham Council School Managers at Chadwell Heath. The building was designed by Mr. J. Kennedy, and provides accommodation for 300 mixed children in six class-rooms, and in addition there is a central hall. The contract sum for the whole work was 4,109*l.*, and the building has been erected by Messrs. Dowsing & Davis, of Romford.

SCHOOL ADDITIONS, ST. BEES.—A new chapel and laboratories have been erected at St. Bees Grammar School. The extensions were designed by Mr. John F. Curwen, Kendal. They comprise entrance hall with porch, physical laboratory, 40 ft. by 28 ft.; chemical laboratory, 39 ft. by 28 ft.; lecture theatre, 34 ft. by 28 ft.; preparation-room in connexion with the two last named; library and museum, 50 ft. by 28 ft.; masters' common room, 15 ft. by 14 ft.; chapel with porch, nave, aisles, chancel, organ chamber, and vestry, and basement, containing heating chamber, coal store, etc. The whole is built of red sandstone from the St. Bees quarries, having wood block floors and open timber roofs, glazed brick dadoes to laboratories, lecture theatre, and preparation-room, and plaster walls over. The chapel seating and roof, etc., are fitted up in oak, and the walls inside are faced with red stone ashlar dressings from St. Bees and Runcorn quarries. The windows are glazed with leaded glazing, and the whole of the buildings are heated on the low-pressure hot-water system, and fitted up with acetylene gas installation.

NEW SCHOOL, MICKLEHAM, SURREY.—A new school is being built at Mickleham to give accommodation for 120 children (eighty-four mixed and thirty-six infants). Mr. H. W. Burrows, of Westminster, is the architect, and the builders are Messrs. Thompson & Beveridge, of London. The contract price is nearly 1,600*l.*, but it is estimated that the total cost of the undertaking, including the furnishing and the making of proper provision for access to the school, will be between 2,500*l.* and 3,000*l.*

BAPTIST SUNDAY-SCHOOL, EYNSHAM.—Two class-rooms are in the course of erection at the back of the Baptist Chapel at Eynsham. The plans were prepared by Mr. R. Harris, of Oxford, and the work is being carried out by Mr. H. J. Green.

NEW ELEMENTARY SCHOOLS, CHELTENHAM.—New elementary schools have been erected for the Cheltenham Education Committee—one in Naunton Park and the other in Gloucester-road. The Naunton Park establishment consists of two central halls and twenty-one classrooms, each department having its own cloak-rooms, lavatories, head and assistant teachers' rooms, and offices. The boys' department has a lunch-room. The girls' and infants' share a similar room, placed between the two departments. The order in which the departments are arranged is:—the boys' to the right, girls' in the centre, and the infants' to the left. Each department has a separate main entrance. The central hall is for the use of both boys and girls, and is 78 ft. by 36 ft. in floor area, 28 ft. high, and with open timbered roof. Grouped around this room are fourteen classrooms, divided equally between the boys' and girls' departments. The infants' department has a central hall of 48 ft. by 24 ft. and 25 ft. from floor to ceiling, surrounded by seven classrooms. Of the classrooms in the two upper departments, four are for sixty scholars each and the remainder for fifty each, and in the infants' department one is for sixty and the remaining six for fifty each. The windows are all made to open at the top and bottom; and hopper fresh-air inlets are provided in the walls of every room. The vitiated air will pass away through tubes from the ceilings, these connecting with patent ventilation-pumps on the ridges. The warming will be by a combination of pipes and radiators on the low-pressure system. Except in the corridors and lavatories, where granolithic has been laid down, wood blocks have been used for the flooring. The doors throughout the building have red deal frames with pitch-pine panels, and are lightly stained and varnished. The windows and the whole of the remaining interior woodwork is in red deal. The walls of all the rooms and corridors are finished with a dado to the height of 4 ft. The upper parts of the walls throughout are coloured with cream Duresco. The cloak-lobbies in each department have rails connected with the hot-water apparatus for drying damp garments, and adjoining each is a lavatory provided with half-a-dozen wash-hand bowls in glazed earthenware. Around the schools extend asphalted playgrounds, and at the rear are sanitary offices and sheds open upon one side. The loan asked for to pay for the schools is 14,000*l.* The Gloucester-road school stands on a site of 1¾ acres, and the accommodation it provides is similar to that of the Naunton Park building. Mr. Charles Wright, of Leicester, was the builder, and the sub-

contractors were Messrs. Hancock & Son, iron-workers; Messrs. Steel, Ltd., electrical engineers; and the Acme Flooring Company. Upon both contracts Mr. William Wiggall represented the Committee as clerk of the works. The loan which will be required will be 14,152*l*. The plans of Messrs. Chatters & Smithson for both schools were accepted in open competition.

LANGHAM HOTEL, W.—Mr. J. Macvicar Anderson has been appointed architect of an addition which it is proposed to make at the rear, in Cavendish-place, of the Langham Hotel. The hotel, one of the earliest after its kind in London, was built upon the site of (old) Foley House in 1863–5, after John Giles's plans and designs, illustrated in the *Builder* of July 25, 1863.

PROPOSED ENLARGEMENT OF AUCKLAND WORKHOUSE. — The Auckland Board of Guardians have decided to apply to the Local Government Board for permission to raise a loan for the purpose of enlarging and improving the Workhouse under their control. The plans for the proposed work have been prepared by Mr. F. H. Livesay.

DRILL-HALL, CROYDE, DEVON.—A drill-hall has been erected at Croyde from plans by Mr. J. C. Southcombe, of Barnstaple. The building, which is built of local stone, is 80 ft. by 20 ft., and will accommodate about 300 persons.

UNITARIAN BUILDINGS, STOURBRIDGE.—Sir William B. Bowring, Bart., recently laid the foundation-stone of the buildings being erected by the congregation of the Stourbridge Presbyterian (Unitarian) Chapel at Lower High-street. The new buildings, which comprise a Sunday school and chapel rooms, are being erected to plans prepared by Mr. T. Grazebrook, the builders being Messrs. Guest & Sons. They occupy a site immediately adjoining the chapel, and the front elevations are to be of brick, relieved by terra-cotta. The total cost involved is about 1,500*l*.

WORKMEN'S CLUB, SEAHAM, SUNDERLAND.—New premises are being erected for the New Seaham Working Men's Club and Institute, Ltd. They will be of stone with coloured terra-cotta dressings and Accrington first quality pressed facing bricks. On the ground floor there will be a front sitting-room, and behind that will be the general bar. The caretaker's house will be situated in the rear. The first floor is to be reached by a staircase in concrete, which enters on to a landing. This will be used as a buffet. Doors will lead off to a large billiard-room with two tables, and immediately behind, separated by a movable screen, will be a committee-room, the whole forming, when the screen is removed, one large entertainment or lecture-room. Over the front entrance is a small room to be used as a library. A feature of the building will be the large entrance hall and lounge. For the present the first section only of the club will be built, at a cost of about 2,500*l*., but when the whole is complete it is expected that this sum will be increased to about 4,000*l*. The second section includes, on the ground floor, a games-room and a sitting-room, and on the first floor reading-room and other club rooms. It is also intended here to provide baths, lavatories, etc. The contractor for the work is Mr. Jos. Huntley, of Sunderland, and the architect Mr. O. H. Mark, of Sunderland.

Sanitary and Engineering News.

BRIDGE, LITTLEHAMPTON.—A new steel girder bridge is being erected over the river at Littlehampton. On the west side of the river there will be a fixed span, covering one-third of the distance across, and a swinging span on the east or Littlehampton side. It will rest in the centre, on a pivot, and when opening to allow ships to pass up or down the river will describe a quarter of a circle. When the bridge is opened the space left will be 75 ft., which is considered sufficient for any ships entering the harbour. The contractors for the work are Messrs. A. Thorne & Sons, of Westminster, and their estimate for the bridge was 12,988*l*. Major H. Tulloch prepared the designs. Mr. W. Fletcher Robinson is the resident engineer, and Mr. William Burrows the chief erector.

PROPOSED REFUSE DESTRUCTOR, CHELTENHAM.—On the 6th inst., Mr. A. W. Brightmore, D.Sc., M.Inst.C.E., Inspector of the Local Government Board, held an inquiry at the Cheltenham Town Hall into an application by the Town Council for sanction to a loan of 3,400*l*. for a new refuse destructor and steam-raising plant, with the necessary building to accommodate the same. The Borough Surveyor (Mr. J. Pickering) gave details of the proposed work, and said it was intended to house the new destructor in an inexpensive building consisting of steel frames, the panels filled in with concrete slabs. The makers of the new destructor guaranteed that it would burn from 40 to 43 tons in two shifts of nine hours each. After further evidence had been given the inquiry closed.

PROPOSED DESTRUCTOR, TONBRIDGE.—A Local Government Board inquiry with reference to the Council's application to borrow 2,700*l*. for filter-beds, and 5,000*l*. for a refuse-destructor at the Tonbridge Sewage Farm, was held in the Tonbridge Council Chamber, by Mr. R. H. Bicknell, M.Inst.C.E., on the 31st ult. Mr. H. W. Peach (Clerk to the Council) explained that the present plant for dealing with the town's sewage was installed thirty years ago. The population in that time had increased from 8,000 to 14,600, and the plant had practically worn out. The Council proposed to construct three filter-beds adjoining the present works, and to enlarge the existing tanks. Mr. W. L. Bradley (Surveyor to the Council) said it was intended to instal pumps to raise the sewage to a high level on the farm for distribution. Mr. John Parker (Surveyor to the City of Hereford) also gave evidence in favour of the scheme.

DRAINAGE IN WESTMINSTER.—According to the annual report of the Medical Officer of Health for Westminster 609 sets of drainage, etc., plans were examined during 1906; 508 of these resulted from notices served by the Public Health Department, and 101 were plans of new buildings or reconstructions, the drainage of which is under the supervision of the City Engineer, with the exception of such matters as come under the Public Health Act and by-laws made thereunder in respect of water-closets, water supply, ventilation, etc. In 140 instances plans had to be amended and sanction was refused altogether with regard to two of them. Failure to send in plans as required by law occurred ten times. Infringements of the by-laws in connexion with the erection of buildings occurred in four instances, and in each case the persons responsible were cautioned by the Public Health Committee. One thousand three hundred and thirty-four drainage systems were tested during the year, of which 339 with smoke, or water, were carried out under the supervision of the sanitary inspectors by the men of the disinfecting staff. The routine is to test a drain first by means of chemicals, and, if necessary, subsequently with smoke, air or water. After relaying, drains below ground are tested with water; pipes above ground with smoke or air. The numbers of each test employed were:—chemical, 532; water, 567; smoke, 169; air, 147.

DIPHTHERIA AND "BAD DRAINS."—Dr. William Butler, Medical Officer of Health for Willesden, in his annual report which has just been issued, says that the incidence of diphtheria was much greater on houses provided with interceptors than on the older houses where the drains were not disconnected from the sewers. In the low lying parts of the district drains with interceptors were more liable to blockage or to provide ventilation to the sewers beneath the windows of the houses where the cap of the raking arm had been displaced. The frequency with which this was found to happen was shown by the results of three special inspections of manholes as follows—October, 1905, (1) number of inspections 6,745, (2) number choked 288, (3) stoppers missing 654; January, 1906, (1) 504, (2) 49, (3) 41; November, 1906, (1) 5,322, (2) 204, (3) 266. On the total number of special inspections made the percentage choked, therefore, was 4.3 and the percentage where stoppers were missing was 7.6. A casual relationship exists between exposure of young children to the emanations of sewage and the incidence of diphtheria; but the intercepting trap and the drain ventilator, wrongly known as an inlet, is a device that effects this exposure to an infinitely greater degree than even faulty drainage of an older type. In a word, he was of opinion that the phenomena of the differential incidence of diphtheria was in some measure accounted for by the defective type of drainage compulsorily adopted in new districts. He did not wish to be misunderstood in saying this. He was convinced that there was a great misapprehension as to the cause of diphtheria, and much needless alarm as to the condition of the drainage when a case of diphtheria occurs in a house. Diphtheria is not caused by "bad drains," and probably in every case where a child develops the disease it has caught it by exposure to infection from another child suffering from the same disease. But exposure to sewage emanations does, in his opinion, as is traditionally believed, predispose to throat infections. To live in an atmosphere polluted with sewer gas was, other things equal, to be predisposed to diphtheritic infection. It was on this ground and in this way that he accounted for the remarkable endemicity of diphtheria in the lower lying areas of West Willesden.

DRAINAGE WORK IN PADDINGTON.—According to the annual report of the Medical Officer of Health of Paddington (Dr. Dudfield), which has just been issued, during the past year 696 new drains were constructed in connexion with existing premises as against 669 in 1905, and 858 in 1904. In each case the new work was tested in sections, and as a whole during construction, and again as a whole after filling in trenches, etc. In 1905, 235 of the 669 reconstructions were on the Queen's Park estate; last year the corresponding figures were 162 out of 696, indicating that the work on the estate is not progressing at the same rate as in previous years. 100 old drains were water-tested during the year and found to be sound, the number so tested in 1905 having been eighty-one. The passing of plans and notices for reconstructional work is entirely under the jurisdiction of the Public Health Department, and involves a large amount of correspondence. In four cases summonses were required to secure the proper notices, plans, etc. On the whole better drawings are now submitted, and less difficulty is experienced in obtaining the necessary particulars. All notices and drawings being in duplicate, one set is, by direction of the Public Health Committee, now returned to the party depositing same with an endorsement stating that the work shown has been carried out under the supervision of the inspector.

Stained Glass & Decoration.

WINDOW, BUDOCK CHURCH.—A three-light window in the east end of Budock Church has been filled with Munich stained glass; the subject represented being "Christ Blessing Children." It has been erected by Mrs. Blank, of Falmouth, in memory of her husband, a merchant of the City of London. Messrs. Mayer carried out the work under the supervision of Mr. Huss, the architect, of Budock, near Falmouth.

ALL SAINTS', MAIDSTONE.—Frescoes have been placed on the east wall of this church and the re-table improved with a lining of polished alabaster. Messrs. Clayton & Bell carried out the work, principally on the advice of Mr. Pearson.

MEMORIAL WINDOW, HAWARDEN.—The dedication recently took place of the new Burne-Jones east window in Hawarden Parish Church. The window, which was designed by the late Sir E. Burne-Jones, has been put in by Messrs. Morris & Co., of Merton Abbey, Surrey. The representation is that of our Lord crucified upon the Tree of Life. Beneath the hands on the right is the figure of the Virgin, clad in blue robes; on the left St. John in crimson raiment. In the top lights are crimson-winged cherubim and seraphim. Below there is an inscription.

Foreign.

FRANCE.—M. Maillard, the sculptor of the monument to Fragonard, recently illustrated in the *Builder*, has received the cross of the Legion of Honour, which has also been bestowed upon M. Bertaumieux, "Censeur" of the Société Centrale des Architectes, and President of the "Société de Secours Mutuels de Bâtiment." M. Tony Robert-Fleury, former president of the Société des Artistes Français, has been promoted to be "Commandeur."——The Government has decided to transform the prison at Vincennes into a historical museum. The building, called "Le Donjon de Vincennes," was built under Charles V., and is one of the most interesting monuments of mediæval military architecture.——M. Denys Puech, the sculptor, is at work on a fine monument to the memory of Henri Germain, the founder and former Director of the Crédit Lyonnais.——The Municipality of Grenoble intend to transfer the Ecole Vaucanson to the old building of the Seminaire du Rondeau. The cost of the installation will be about 300,000 francs.——A new railway line is to be made from Neubourg to Caudebec at a cost of 1,300,000 francs.——Important works have been commenced for the improvement of the port of St. Nazaire at a cost of 2½ million francs.——The Municipality of Luneville are about to expend a sum of 1,200,000 francs on a new sewerage system.——The Municipality of Aurillac have decided on the erection of a college for girls at a cost of about half a million francs.——The Municipal Council of Lyons have voted 6 million francs for the erection of twelve new groups of school buildings.——An interesting exhibition has been organised in the Chapel of Clément VI. in the Palace of the Popes at Avignon. The exhibition includes a historical collection of works of art previous to the XIXth century, including XVth and XVIth century pictures, drawings, ironwork, and furniture. There is also a "Vauclusian" gallery, and a section of contemporary art.——The Department of Fine-Arts has ordered the restoration of the Romanesque tower of the church of Redon, and also of the isolated tower connected with the same church.——The death is announced, at the age of sixty-two, of the painter and architect Adrien Jourdeuil, a former pupil of Bouguereau, Bonnat, and Robert-Fleury. He had received medals in the Salons of 1885, 1888, 1889, and 1905.——The death is also announced of Desiré Bloche, sculptor, who assisted in the decorative sculpture of the Opera House, the Vaudeville, and the Hôtel de Ville of Paris; and in that of the Theatres of Angers and Reims, as well as of various churches and other architectural monuments. He was eighty years of age.

GERMANY.—On July 5, at Carlsruhe, died Friedrich Ratzel, a man who ranked amongst the foremost in German art. Although he died from overwork at the early age of thirty-eight he has left a record behind him such as men of twice his years might well envy. He studied architecture at the High School, Carlsruhe, and in the offices of Höchgurtel & Seeling in Berlin. Besides holding the Chair for Architecture at Carlsruhe University he had a large private practice, and won numerous important competitions which have made his name famous. Heidelberg, Carlsruhe, Mannhein, Mainz are a few of the towns which have been beautified by his striking and characteristic work, while Duisberg and Freiburg-i-B. are still awaiting the erection of important buildings won by him in competition. He adopted the style of modern German Renaissance, but his work bears the stamp of strong individuality and will therefore endure. ——The restorations which have been carried out in Worms Cathedral under the direction of Herr Hoffmann from 1892–95 have cost 525,000 marks, nearly one-third of which sum was spent on pulling down and rebuilding the west choir and the lantern over the crossing. As this is perhaps the finest part of the Cathedral it was decided that rather than patch it up for a few decades it should be restored so as to last many centuries. Further large sums were spent on underpinning the foundations to a depth of over twice their original depth. The walls were cracking, not from defective construction, but from the foundations being only carried on an uneven layer of clay instead of having been carried down 8 metres to the gravel bed below. As soon as further funds have been collected the restorations will again be taken in hand, and it is hoped that additional discoveries will be made which will throw more light on the history of the Cathedral.

AUSTRIA.—Several new monuments are in course of erection in Vienna. The Brahms' monument in the Ressel Park, by Professor Weyr, consists of a marble seated figure of the master; the Augustin Fountain, by Scherpe, shows Augustin marching and playing on the bagpipes, while the plinth is covered with bas-reliefs of historical pictures of the time of the Turkish domination; the Rudolf v. Alt monument, to be erected on the Minoritenplatz, is also by Scherpe; the statue of Hess, by the academic sculptor Josef Tuch, is in the hands of the founders, and the work is so far advanced that the monument is to be unveiled in 1909. Karl Wollek won the first prize in the competition for the Emperor Francis Joseph monument, to be erected in Jägerndorf, Silesia. The monument, which is to be unveiled next year in the square before the Town Hall, is an equestrian statue showing the Emperor in field uniform seated on a horse which is standing still. At each corner of the square pedestal is an eagle, while the arms of the Austrian crownlands adorn the space immediately below the statue.——A number of admirers of the poet Peter Rosegger have selected the Styrian sculptor Hans Brandstetter to design a memorial to his friend. Brandstetter has elected to represent a scene from Rosegger's best-known poem, "The Woodland Schoolmaster." On a mighty rock, out of which bubbles the refreshing spring, sits the sylvan sage, who has the bearing and features of Rosegger, holding converse with a young roebuck. The figures are of bronze, the pedestal, inscribed "To the Woodland Poet," of red Swedish granite.——Some difficulties are arising in consequence of the expense entailed in forming an Architectural Exhibition in connexion with the International Architectural Congress to be held next May in Vienna. The Government does not see its way to granting the help asked of it, but the idea is so popular that foreign nations, amongst which Germany and France, have volunteered to bear the expense of decorating the rooms apportioned to them. Amongst the subjects to be discussed are the question of status, styles, re-organisation of international competitions, etc. The proposed entertainments are as follows:—(1) The formal opening of the Congress under the patronage of the Emperor, in the Grand Hall of the Hofburg; (2) Reception at Court; (3) Banquet in the Guildhall; (4) Trip on the Danube to visit the Klosterneuburg Monastery and Kreuzenstein Castle; (5) Reception by Count Lanckoronski; (6) Drive round the town; (7) Expedition to the Semmering Pass. The number of members to be limited to 2,000.

HOLLAND.—A protest, signed by several of the leading Dutch architects, has been laid before the Second Chamber at Gravenhage, objecting to the site chosen for the Peace Palace at the Hague; to the conditions of the competition, and to the choice of the jury. The Chamber is begged to use its influence "to the end that the Palace be built amidst worthy surroundings, and that it express the sublime idea to which it is consecrated." Further, "that moral compensation be given so far as is possible to those architects whose interests were affected by the course the competition took."

BULGARIA.—The town of Rustschuk proposes building an aqueduct and irrigating the township. In order to obtain schemes it announces an international competition, and offers three prizes of 12,000, 8,000, and 4,000 francs respectively. Further information to be obtained from the Town Magistrate, Rustschuk, to whom projects are to be sent in before December 1.

Miscellaneous.

RUSSIAN TIMBER AND GRANITE.—Mr. Consul Thesiger, of St. Petersburg, reports that the export of timber during the navigation season of 1906 showed a considerable increase as compared with preceding years. Shipments were made from the new timber harbour at St. Petersburg as also from Cronstadt; the greater number of boards, battens, and logs were, however, shipped from the latter port. The number of vessels laden with timber that left both ports was 378, and they were mostly bound for the United Kingdom. The prices obtained by the local firms engaged in the export of timber to foreign markets were comparatively low owing, it is stated, to the deal yards being stocked, and it was not until late in the autumn that the prices rose somewhat. It is therefore doubtful whether the local exporters were able to gain much profit on the business done, notwithstanding the increased shipments made by them. Freights on timber during the whole of the navigation season stood very high. Mr. Vice-Consul Wancke, in reporting on the trade of Abo, Finland, states that the principal article of export is mill-sawn timber, which, in 1906, in spite of the stimulating effect of higher prices, showed a decrease in quantity (39,764,580 St. Petersburg standards, valued at 238,587*l.*), compared with previous years. The decrease has been continuous since 1903, and the reason for this is that the forests are being gradually depleted. Red granite of excellent quality was discovered in the vicinity of Abo during 1906. Operations for the quarrying of the same have been commenced, and large quantities are sure to be exported in the future.

INTERNATIONAL CONGRESS ON ART EDUCATION.—The third Congress will be held in London in August of next year. An important exhibit will come from the United States in the shape of works from industrial art schools and public schools and colleges, under the auspices of an official committee, of which Mr. James Hall, Director of the Art Department of the New York Ethical Culture School, is Chairman, and Mr. W. Woodward, Professor of Art, New Orleans Newcomb College, and Mr. C. M. Carter, Director of Art Education, Denver, are members. Miss Florence Levy, editor of the *American Art Annual*, has undertaken to organise the conduct of a movement to awaken the young to the beauties and attractions of art by taking them to public collections, churches, and other buildings, and by obtaining permission for them to visit artistic homes in New York.

LIVERPOOL HISTORICAL EXHIBITION.—The collections of prints and views, maps and plans, pottery, and illustrations of shipping, constitute notable sections of the exhibition which has been opened in the Walker Art Gallery. The maps and plans recall the times when the commerce of the town had no existence and when its boundaries did not extend beyond Canning-square (formerly the Pool), Paradise-street, and Whitechapel, the present Municipal Buildings, and St. Nicholas Church. In the XVIIIth century Liverpool was a centre of clock and watch making, and many exemplars of the industry are contributed to the exhibition.

NATIONAL TRUST.—The Bill promoted by the Trust has passed through its stages unopposed in the House of Commons. Its main object is to re-incorporate the members of the Trust as a statutory body, with legal powers of preventing any injury, destruction, or defacement of property belonging to or controlled by the Trust to which the public have access.

THELWALL CHURCH.—A lychgate has just been erected by Mr. Woods, Hartford, at the entrance to Thelwall Churchyard, from the design of Messrs. W. & Segar Owen, of Warrington. The gate is of oak and stands upon sandstone walls, and the roofing is of oak shingles. Also a memorial tablet, in cryptic form, has been placed on the south wall of the nave of this church. It is in walnut, with a gilt top and base, and was designed by Mr. F. C. Eden, London, the makers being Messrs. Helfer Bros., London.

DEMOLISHING BUILDINGS IN WESTMINSTER.—Dr. Allan, Medical Officer of Health for Westminster, in his annual report just issued, says that considerable annoyance frequently arises from buildings during demolition, and in old buildings the dust may be a source of danger. The City Engineer has been in the habit of inserting in licences for hoardings a clause that in cases where a hoarding projects more than 2 ft. on the public footway, the licensee shall undertake to keep all materials well watered to prevent dust arising. The Council after consideration have agreed that a condition shall be inserted in all licences issued for hoardings erected on the public way, irrespective of the extent of the encroachment, requiring that during the demolition of premises proper and sufficient screens shall be provided and compelling the use of water for preventing nuisance from dust.

NEW OGEE GUTTER.—Messrs. Pryke & Palmer, who were awarded a bronze medal at the School Building and Furnishing Exhibition, as stated in our report last week, have written to point out that the principal advantage of their new ogee gutter is that the wedge-shaped projections on the back allow it to be fixed with the front and back edges level. In the ordinary ogee gutter the sloping back causes the front edge of the gutter when fixed to be lower than the back edge, and the capacity of the gutter is thus considerably reduced.

MEMORIAL TO FERGUSON, THE ASTRONOMER.—A memorial was recently unveiled in Rothiemay, Banffshire, to James Ferguson, the astronomer, who was a native of that place. The monument consists of a granite upright cross on a twelve-sided base, on each face of which a sign of the Zodiac is carved. Ferguson's name is on the side of the cross, which also bears the dates of his birth (1710) and death (1766), and likewise commemorates his early patrons and friends in Keith. The design was the work of Mr. William Kelly, architect, Aberdeen.

CHANGES IN LINCOLN'S INN-FIELDS.—A formal notification has been made that the site of the Sardinian Chapel, at the rear of the west side of Lincoln's Inn-fields, will be taken for a completion of Kingsway, and that the building should be vacated in the course of next spring. In last March the London County Council approved the elevation of the new church which, with a presbytery, will be built in Kingsway. The east, and older, portion of the existing chapel of SS. Anselm and Cecilia has an octagonal dome with lantern, carried by four arches, a gallery and a rounded apse; the west portion is much plainer, and contains a lower and an upper gallery. A reference to the *Builder* of October 22, 1898, will show how erroneous is the generally adopted statement that the chapel was erected in 1648—that is to say, at the time of the building of the archway at the east end of (old) Sardinia (until 1878, Duke) street; over the middle arch on each face is a tablet inscribed "Dvke Streete 1648." Duke-street was originally Forfue, or Fortifeue, lane, leading from Fyckett's-fields through the Purse-field (opposite Arch, or West, row), and so to Via de Aldewyche, since Drury-lane. An enquiry we ourselves made in the matter shows that in November, 1687, the Franciscan Fathers of the Second English Province of Friars Minor resolved to acquire "the spot near the Arches [Arch-row] in Lincoln's Inn-fields lately in the possession of the Countess of Bath." A novitiate of Our Holy Father St. Francis was opened in the new chapel in October, 1688. Nos. 53-4, Lincoln's Inn-fields, formed at one time a single house occupied by the Portuguese, and afterwards by the Sardinian, Embassies; No. 54, latterly the presbytery, extends over one half of the archway, and communicates through the old hall and a door with the chapel in the rear. The attack made by the mob upon the ambassadors' houses and upon this and other chapels in London in the night of Tuesday, December 11, the day of King James II.'s flight from Whitehall, is commemorated by a beautiful and rare medal executed by George Bower for presentation to William and Mary—the medal is illustrated in our article cited above. The reverse bears in finely wrought relief a view of the chapel and house in ruins, the old elevations of Arch-row with the front walls between the piers of the fore-courts, and the mob burning the crosses and other Papal emblems in the fields delimited with posts and rails. At that time James Ayrey, Vicar of the Friary, was chaplain to the Spanish Ambassador, Dom Pedro Ronquillo, who lived in Wild House—which the mob sacked and set in flames—situated between Duke and Great Queen streets. In the night of Friday, June 2, 1780, the "No Popery" rioters attacked the chapel—the Marquis de Cordon being then the Sardinian Ambassador. The damage was repaired by rebuilding, and the chapel was enlarged westwards upon the site of the Embassy stables. The church possesses a valuable service of plate, in lieu of that given by one Sadler, which was saved in 1688, and sent by the Fathers to Douai. The costly altar furniture is a gift of Charles Albert, King of Sardinia (*ob.* 1849). The very old and quaint house, distant but a few yards, Nos. 13-4, Portsmouth-street (north end), containing four rooms, will very shortly be pulled down. As the *soi-disant* "Old Curiosity Shop, immortalised by Charles Dickens," it has many visitors. Whilst that ascription, clearly, has no warrant whatever, it is said that the house was the dairy of the Duchess of Portsmouth, *temp.* Charles II.; the Ordnance Survey marks Portsmouth-place in that, the south-west, corner of Lincoln's Inn-fields as the "site of Portsmouth House." The house was in a ruinous condition, and, in fact, was virtually condemned in January, 1884.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competition.

* NO DATE.—**Southport.**—NEW SCHOOLS.—The Corporation of Southport invite architects practising in Lancashire to submit designs for new public elementary schools, to cost about 13,500*l.* Premiums of 50*l.*, 30*l.*, and 15*l.* will be paid. For further particulars refer to an advertisement in this issue.

Contracts.

BUILDING.

AUGUST 17.—**East Grinstead.**—SCHOOL ENLARGEMENT.—East Sussex Education Committee invite tenders for enlargement of the Girls' Department of the East Grinstead Public Elementary Council School. Names and addresses to Mr. F. J. Wood, County Surveyor, County Hall, Lewes.

AUGUST 17.—**Topsham.**—STABLES, ETC.—A range of stables and lofts at Denver Nurseries, Topsham, for Mr. George Pyne. Plans and specifications may be seen at offices of Messrs. E. H. Harbottle & Son, architects, County Chambers, Exeter.

AUGUST 19.—**Belfast.**—SHED.—Belfast Harbour Commissioners invite tenders for the erection of a goods shed on the South Quay of the York Branch Dock, Co. Antrim, in accordance with drawings, which may be seen at the office of the Harbour Engineer, Mr. W. Redfern Kelly, M.Inst.C.E., from whom copies of specification, form of agreement, and any further information may be obtained.

AUGUST 19.—**Hull.**—SCHOOL ADDITIONS.—Hull Education Committee invite tenders for the necessary work to be performed in the alterations and additions to the Blenkin-street School. Drawings and specification may be seen at office of Mr. Joseph H. Hirst, City Architect, Town Hall, Hull, and quantities obtained upon a deposit of 2*l.* 2s. Remittances to be made payable to the City Treasurer.

AUGUST 19.—**Nottingham.**—SCHOOL WORKS.—Nottingham Education Committee invite tenders for alterations and additions to All Saints' Council School, Infants' Department, Raleigh-street. Plans may be seen, and copies of the specification, bills of quantities, and forms of tender obtained, from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1*l.* 1s.

AUGUST 19.—**Nunney.**—TEACHER'S DWELLING-HOUSE.—Somerset C.C. County Education Committee invite tenders for extensions to the teacher's dwelling-house, Nunney Council School. Plans and specification may be seen at County Education Office, Weston-super-Mare, and further information obtained from Mr. A. J. Pictor, Bruton.

AUGUST 19.—**Warrington.**—ALTERATIONS TO PREMISES.—Warrington Finance and Estate Committee invite tenders for alterations to premises, Sankey-street, formerly known as the Queen's Hotel. Drawings may be seen, and forms of tender, bills of quantities, and all further information obtained, at the office of the Borough Surveyor, Town Hall.

AUGUST 20.—**Cardiff.**—WAREHOUSE.—The erection of a three-storied warehouse at Ely Paper Works, Cardiff, for Messrs. Thomas Owen & Co., Ltd. Plans and specification can be seen, and bills of quantities obtained, on application to Mr. John W. Rodger, architect and surveyor, 14 High-street, Cardiff.

AUGUST 20.—**Cork.**—RESIDENCE.—Cork District Lunatic Asylum Committee of Management invite tenders for the erection of a residence for the Land Steward on Mount Desert Farm, according to plans and specification to be seen at the office of Mr. W. H. Hill, C.E., 28 South Mall, Cork, or at the Asylum.

AUGUST 20.—**Dewsbury.**—SLUDGE PRESS HOUSE.—The erection of a sludge press house and contingent works off Thornhill-road, Dewsbury. Drawings and specification may be seen, and quantities and form of tender obtained, at office of Messrs. C. H. Marriott, Son, & Shaw, Church-street Chambers, Dewsbury, on payment of 1*l.* 1s.

AUGUST 20.—**Plymouth.**—REINSTATEMENT.—The Incorporation of Guardians of the Poor of Plymouth invite tenders for the reinstatement of the portion of the Workhouse damaged by fire. Drawings, specifications, and general conditions to be seen, and a copy of the bill of quantities obtained, on payment of a deposit of 2*l.* 2s., at the offices of the architects, Messrs. Thornely & Rocke, 11, The Crescent, Plymouth.

AUGUST 20-SEPTEMBER 6.—**Southery.**—SCHOOL WORKS.—Norfolk Education Committee invite tenders for the erection of the proposed new cloakrooms and outbuildings at Southery School. Names to the architect, Mr. H. J. Green, Castle Meadow, Norwich, and Paradise-chambers, King's Lynn, from whom bills of quantities can be obtained, and at whose office plans and specification can be inspected. A deposit of 2*l.* 2s. will be required.

AUGUST 21.—**Aberavon.**—MARKET.—For the building of a new market, viz.:—(1) For masonry and general work; and (2) for roofing. Drawings may be seen at the Council Offices, and specifications and forms of tender obtained from Mr. J. Roderick, Borough Surveyor, on payment of a deposit of 2*l.* 2s.

AUGUST 21.—**Chipping Sodbury.**—WORK AT SCHOOL.—The Elementary School Managers invite tenders for work to be carried out at the school in accordance with the requirements of the Board of Education. Specifications and plans may be seen at office of Mr. Charles G. Watts, Melbourne House, Chipping Sodbury.

AUGUST 21.—**Halifax.**—DWELLING-HOUSES.—Nine dwelling-houses at Woodside-view, Halifax. Plans and specifications can be seen, and quantities obtained, at offices of Messrs. Geo. Buckley & Son, Tower-chambers, Halifax.

AUGUST 23.—**Hennock.**—FARMHOUSE.—The erection of a farmhouse at Lower Crockham, Hennock (close to Trusham Station). Plans and specifications may be inspected, and bills of quantities obtained, at the offices of Messrs. Ellis, Son, & Bowden, F.S.I., surveyors and architects, Bedford-chambers, Exeter.

* AUGUST 24.—**Edinburgh.**—EXHIBITION BUILDINGS.—The Scottish National Exhibition, Edinburgh, 1908, invite tenders for erection of the industrial hall at Saughton Park. For further particulars refer to an advertisement in this issue.

AUGUST 24.—**Gelligron.**—ROADS AND HOUSES.—For making new roads and erecting fifty or more houses, together with boundary walls and sewers and surface drains, for the Gelligron Building Syndicate. Plans and specifications may be seen at offices of Messrs. Lewis & Morgan, architects and surveyors, 55, Dunraven-street, Tonypandy; Market-street, Pontypridd; and 1, Mill-street, Tonyrefail, on payment of a deposit of 1*l.* 1s. Applications may also be sent to 12, Edwards-terrace, Cardiff.

AUGUST 24.—**Pontypridd.**—PREMISES.—The pulling down and re-erection of certain premises in Market-street, Pontypridd, for Messrs. P. Lougher & Son. Plans and specification may be seen at office of Mr. Arthur L. Thomas, A.M.Inst.M.E., architect and surveyor, Church-street-chambers, Pontypridd.

AUGUST 26.—**Chipping.**—HOUSE.—The various works required in the erection of a detached house at Chipping for the Manchester Unity of Oddfellows. Plans may be seen, and quantities obtained, at office of Mr. J. A. Seward, architect, 148, Church-street, Preston.

* AUGUST 26.—**Dartford.**—BAKERY.—The Dartford Industrial Co-operative Society, Ltd., invite tenders for the erection of a bakery. For further particulars refer to an advertisement in this issue.

* AUGUST 26.—**Midsomer Norton.**—HOUSE.—Tenders are invited for a medium-sized stone-built house at Midsomer Norton, near Bath, Somerset. For further particulars refer to an advertisement in this issue.

AUGUST 26.—**Porth.**—HOSPITAL.—The Building Committee of Porth Cottage Hospital invite tenders for the erection of two additional wards. Plans and specification to be seen with Mr. J. Rees, architect, Pentre.

AUGUST 28.—**Rochdale.**—WALL.—Rochdale General Purposes Committee invite tenders for the erection of a retaining wall at Sparth, Manchester-road, Rochdale. Plans may be seen, and copies of the form of tender, bill of quantities and further particulars obtained, at the office of Mr. S. S. Platt, Borough Surveyor, Town Hall.

AUGUST 29.—**Cavan.**—BANK HOUSE.—The erection of new bank house at Cavan, for the Hibernian Bank, Ltd., according to plans and specification to be seen at office of Mr. Edward J. Toye, architect, 20, Great James-street, Londonderry. Bills of quantities can be had on application to the architect or to the Bank Manager at Cavan, for which a deposit of 1*l.* 1s. will be required.

AUGUST 29.—**Grantown-on-Spey.**—BUILDINGS.—The mason, carpenter, plumber, slater, plaster, and painter works, and for the iron beams required in new buildings to be erected at 34 and 36, High-street, Grantown-on-Spey, for Mr. J. S. Grant. The plans and specifications may be seen at 34, High-street, Grantown, and at the office of Mr. John Wittet, architect, Elgin.

AUGUST 29.—**Manchester.**—BRICK WALLS.—Manchester Gas Committee invite tenders for the work required to be done in the erection and completion of new brick walls, etc., including all stonework, joiners' work, slaters' and plumbers' work, to No. 2 Retort House at their Gaythorn Station. Specification, bill of quantities, and form of tender can be obtained on application (in writing only) to Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester, on payment of 1*l.* 1s. Drawings may be seen, and any other information obtained, on application to Mr. J. G. Newbigging, M.Inst.C.E., at his office, Rochdale-road Station.

AUGUST 29.—**Stanley.**—MANSE.—The erection of Primitive Methodist Manse, Stanley. Plans and specifications may be seen at office of Mr. Wm. Forster, architect, Stanley.

AUGUST 30.—**Hayward's Heath.**—REPAIRS, ETC.—The Visiting Committee of Brighton County Borough Asylum invite tenders for sundry small general repairs to and painting, distempering, and papering of the cottages on the estate, and also of certain officers' rooms and servants' bedrooms in the Asylum Buildings. The Visiting Committee also invite tenders for the execution of repairs to the farm buildings, the re-roofing of the cow-house, and also for the erection of a cow hovel in the cattle yard. Specifications and forms of tender can be obtained and the plans seen, at the offices of the Surveyor to the Asylum, Mr. J. G. Gibbins, F.R.I.B.A., of the firm of Messrs. J. G. Gibbins & Son, architects and surveyors, 3, Palace-place, Brighton.

* AUGUST 30.—**London.**—COUNTY COURT.—The Commissioners of H.M. Works and Public Buildings invite tenders for a new County Court and offices at Brompton, S.W. For further particulars refer to an advertisement in this issue.

* AUGUST 31.—**North Wales.**—NEW COLLEGE BUILDINGS.—The University College of North Wales invite tenders for proposed new college buildings. For further particulars refer to an advertisement in this issue.

SEPTEMBER 3.—**Aldershot.**—UNDERGROUND CONVENIENCES.—Aldershot U.D.C. invite tenders for the construction of an underground convenience in High-street, adjoining the County Police-station. Plans and specifications may be seen, and full particulars may be obtained, on application at office of Mr. Fred. C. Uren, Surveyor, Surveyor's Department, Municipal Buildings, Aldershot.

SEPTEMBER 3.—**Maidstone.**—EXTENSION OF ELECTRICITY GENERATING STATION.—Maidstone Corporation invite tenders for the erection of extensions to the Electricity Generating Station, Fair Meadow. Application for bills of quantities and form of tender to be made at the office of the Borough Surveyor (Mr. T. F. Bunting), Fair Meadow. A copy of the quantities and form of tender will be supplied to those who have made application, in exchange for 2*l.* 2s.

SEPTEMBER 4.—**Hillingdon, Uxbridge.**—HOSPITAL BUILDINGS.—The Uxbridge Joint Hospital Board invite tenders for the erection of hospital ward block, observation ward block, administrative block, and laundry and disinfector block at their hospital, Kingston-lane, Hillingdon, together with works of drainage, roadmaking, fencing, etc. Bills of quantities to be obtained at the offices of the Board's Architect, Mr. William L. Eves, F.R.I.B.A., Uxbridge, Middlesex (where the drawings and specifications may be inspected), on payment of 3*l.* 3s. by cheque.

SEPTEMBER 4.—**Sunderland.**—HOSPITAL.—The Committee of the Sunderland Infirmary invite tenders for the erection of a new hospital for children at High Barnes, Sunderland. Drawings, specification, and copy of conditions and form of contract may be seen at the Infirmary Offices, Bank-buildings, Fawcett-street, Sunderland, between the hours of 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained from Mr. Thomas Robinson, Secretary, Infirmary Offices, Fawcett-street, Sunderland, on payment of 1*l.* 1s.

* SEPTEMBER 4.—**Uxbridge.**—HOSPITAL BUILDINGS.—The Uxbridge Joint Hospital Board invite tenders for blocks of buildings. For further particulars refer to an advertisement in this issue.

SEPTEMBER 6.—**Treherbert.**—COTTAGES.—The Ynysfaio No. 1 Building Club, Treherbert, invite tenders for the erection of ninety-one cottages, more or less, at the option of the club. Plans and specifications to be seen at the offices of Mr. J. Rees, architect, Pentre.

* SEPTEMBER 12.—**Southwark.**—DAY-ROOM AND WORK-SHED.—The Guardians of the Southwark Union invite tenders for the erection of a day-room and work-shed at their St. George's Workhouse, Mint-street, S.E. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 14.—**Smallthorne.**—SCHOOL EXTENSION.—The Staffordshire Education Committee invite tenders for proposed additions at Bradeley Council School, Smallthorne. For further particulars refer to an advertisement in this issue.

NO DATE.—**Ashby.**—REPAIRS TO SCHOOL.—The Managers of the Ashby Council School (Lindsey C.C. Education Committee) invite tenders for structural repairs and renovation of school premises. Specifications can be obtained from Mr. C. Kendall, High-street, Ashby, Doncaster.

NO DATE.—**Ashford.**—HOSPITAL.—Foundations, brick flues and stacks, boundary walls, roads, paths, and drainage, etc., in connexion with the erection of a proposed isolation hospital at John Bank Wood, Ashford, near Bakewell, for the Haddon Joint Hospital Committee. Plans may be seen, and applications for bills of quantities may be made, at the office of Messrs. Bryden & Walton, architects and surveyors, 3, George-street, Buxton.

NO DATE.—**Leicester.**—ALTERATIONS AND ADDITIONS TO THE WORKHOUSE.—The Guardians invite tenders from local builders for this work. Bills of quantities may be obtained upon application at the office of the architect, Mr. A. H. Hind, A.R.I.B.A., Grey Friars, upon deposit of 1*l.* 1s.

NO DATE.—**Rochdale.**—ALTERATIONS, ETC., TO INN.—Alterations and additions to Cross Yates Inn, Whitworth-road, and Friendship Inn, Bury-road, Rochdale. Plans and specifications may be seen at the respective inns, and all other information obtained by applying to the architect, Mr. J. Wilson, Orchard Villa, Bacup.

ENGINEERING, IRON, AND STEEL.

AUGUST 19.—**Glasgow.**—CAST-IRON PIPES.—Glasgow Corporation invite tenders for supplying about 1,050 tons of cast-iron pipes. The drawings may be seen, and copies of the specification and forms of tender obtained, on application to Mr. J. R. Suthcrland, the Engineer to the Water Department, at his office, 45, John-street.

AUGUST 20.—**London.**—WHEELS, ETC.—The Secretary of State for India in Council is prepared to receive tenders for supply of wheels and axles. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W.

AUGUST 22.—**Dewsbury.**—HEATING, ETC.—Dewsbury Guardians invite tenders for heating, wall tiling, and ventilation of extensions to the infirmary at the Workhouse. Persons desirous of tendering for same may obtain particulars by applying to Messrs. Holtom & Fox, architects, Corporation-street, Dewsbury.

AUGUST 24.—**Cattal.**—REPAIRING BRIDGE.—The West Riding C.C. invite tenders for the works of repairing Cattal Bridge, situate over the River Nidd, near Cattal Village, in the Rural District of Great Ouseburn. Plans may be seen, the general conditions, specification, and bill of quantities obtained, at the office of Mr. F. G. Carpenter, West Riding Surveyor, County Hall, Wakefield. A deposit of 1*l.* will be required. Cheques, etc., must be made payable to the West Riding Treasurer, and sent direct to him at the County Hall, Wakefield.

AUGUST 24.—**Pontefract.**—PARK LAKE EXTENSION.—Pontefract Corporation invite tenders for the whole of the works in connexion with Park Lake extension. Plans and specifications may be seen at the office of Mr. John E. Pickard, Borough Engineer and Surveyor, Municipal Offices, Pontefract, from whom copies of quantities may be obtained on payment of 1*l.* 1*s.* deposit.

AUGUST 26.—**Aberdeen.**—DOCK.—Aberdeen Harbour Commissioners invite tenders for the construction, delivery, and testing of an iron off-shore floating dock of 600 tons lifting capacity. Copies of the specification and the general contract drawings may be obtained from Mr. R. Gordon Nicol, Engineer, Harbour Engineer's Office, Aberdeen, on payment of 5*l.* 5*s.*

AUGUST 26.—**Coventry.**—ROOFS, ETC.—The Gas Committee of the Coventry Corporation invite tenders for the supply and erection at their Foleshill Works of three steel roofs, each 96 ft. by 41 ft. span and cast-iron columns and rolled steel girders forming elevated tramway. Form of tender, with schedule of quantities, specification, general conditions, and prints of drawings, will be supplied on application and on payment of 1*l.* 1*s.*, which will not be returned.

AUGUST 26.—**Greenock.**—ELECTRIC LIGHTING.—Greenock P.C. invite tenders for the complete electric light wiring and fittings for Smithson Poorhouse and Asylum. Specifications may now be obtained from Mr. R. P. Fairlie, Inspector, P.C. Chambers, Greenock, on payment of 1*l.* 1*s.* Plans may be inspected, and further particulars given, at the office of the Engineer, Mr. T. Crichton Fulton, 44, West George-street, Glasgow.

AUGUST 26.—**Knaresborough.**—STEAM LAUNDRY MACHINERY.—Knaresborough Guardians invite tenders from laundry engineers for the supply of the necessary machinery and laundry appliances. Specification and all particulars may be obtained on application to Messrs. Bland & Bown, architects, Harrogate.

AUGUST 26.—**Manchester.**—FOUNDATION WORK.—Manchester Electricity Committee invite tenders for the foundation work of a 6,000 K.W. turbo generator, floor extension, air ducts, filter-house, etc., required at their Stuart-street generating station. Forms of tender and bills of quantities may be obtained on application to Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on payment of a fee of 1*l.* 1*s.* Drawings may be inspected at the offices of the engineers, Messrs. C. S. Allott & Son, 46, Brown-street, Manchester.

AUGUST 27.—**Warrington.**—COAL BUNKERS.—Warrington Electricity and Tramways Committee invite tenders for coal bunkers. Specification and form of tender may be obtained from Mr. F. V. L. Mathias, A.M.Inst.E.E., Borough Electrical and Tramways Engineer, Warrington, on payment of 1*l.* 1*s.* Five shillings will be charged for extra copies of the specification.

AUGUST 29.—**Plymouth.**—PIPES.—Plymouth Corporation invite tenders for the supply and delivery of about 750 yds. of 6-in., 3,000 yds. of 4-in., and 250 yds. of 3-in. cast-iron pipes. Specification and form of tender and other information may be obtained at office of Mr. Frank Howarth, M.Inst.C.E., Water Engineer, Municipal Buildings, Plymouth.

AUGUST 30.—**Walthamstow.**—RAILS, ETC.—Walthamstow U.D.C. invite tenders for the supply and delivery to their goods siding, Lea Bridge Station, G.E.R., of new or second-hand flange steel rails, together with the necessary fishplates, bolts, dog spikes, points, and crossings, and about 1,300 creosoted wood sleepers. Particulars and forms of tender may be obtained at the offices of Mr. G. W. Holmes, A.M.Inst.C.E., Engineer to the Council, Town Hall Annexe, Orford-road, Walthamstow, by previously depositing in cash the sum of 2*l.* 2*s.* for each form.

AUGUST 31.—**Kirkcaldy.**—DOCK GATES, ETC.—The Corporation of Kirkcaldy invites tenders for the construction and erection at Kirkcaldy of a pair of 50 ft. steel dock gates and a swing bridge of 50 ft. span. The drawings are exhibited at the offices of Messrs. Hodges & Bennett, 113, Cheapside, London, E.C., from whom copies may be obtained at a cost of 2*l.* 5*s.*, and the specification and tender forms can be obtained free on application to the Town Clerk, Kirkcaldy.

✱ SEPTEMBER 4.—**Fulham.**—HOT-WATER SUPPLY.—The Metropolitan Asylums Board invite tenders for alterations and additions to the hot-water supply apparatus for certain blocks at the Western Fever Hospital, Seagrave-road, Fulham, S.W. For further particulars refer to an advertisement in this issue.

SEPTEMBER 17.—**Acton.**—WELL.—Acton D.C. invite tenders for the sinking of a tubular well at their Public Baths in Salisbury-street, Acton, together with provision for the carrying out of temporary pumping experiments. Particulars and forms of tender, etc., may be obtained from the Surveyor, at whose office the plan of the existing bath buildings may be inspected.

NO DATE.—**Avonmouth, Bristol.**—CONVERTER STATION.—The Electrical Committee of the City and County of Bristol invite tenders for the construction of a converter station at Avonmouth, including ferro-concrete foundations. Copies of the specification, bills of quantities, and forms of tender can be obtained from Mr. H. Faraday Proctor, City Electrical Engineer, City Electrical Engineer's Office, Temple Back, Bristol, on payment of a deposit of 2*l.* 2*s.*

NO DATE.—**Whitburn.**—RAILWAY SIDING.—Railway and Colliery sidings at Whitrigg Colliery, Whitburn Station. Particulars from Messrs. Robert Forrester & Co., Ltd., 142, West Nile-street, Glasgow.

MISCELLANEOUS.

AUGUST 17.—**Princes Risborough.**—LIGHTING.—The P.C. invite tenders for lighting the town of Princes Risborough for eight months, from September 1, 1907, to April 30, 1908. Mr. John B. Bailey, Clerk to the P.C., Princes Risborough.

AUGUST 21.—**Haddington.**—FENCING.—The erection of an unclimable fence and of wire fencing, extending together to about 1,000 yds., and bounding the Neilson Park at Haddington. Plans and specifications may be seen in the hands of Mr. Alexander Brook, W.S., Bank of Scotland, Haddington.

AUGUST 21.—**Ticehurst.**—STEAM ROAD-ROLLING.—Ticehurst R.D.C. invite tenders for steam rolling in their district. Forms of tender may be obtained from Mr. W. N. Wood, Surveyor, Ticehurst, on a stamped addressed foolscap envelope being forwarded.

AUGUST 23.—**Helston.**—STEAM ROLLERS.—Helston R.D.C. require two steam rollers, for eighty-nine days each, for steam rolling certain roads within their district. Full particulars, terms, etc., to Mr. A. E. Ratcliffe, Clerk of the Council, R.D.C. Offices, Helston.

AUGUST 26.—**Greenock.**—ELECTRIC LIGHTING.—The Greenock P.C. invite tenders for the complete electric light wiring and fittings for Smithston Poorhouse and Asylum. Specifications may be obtained from Mr. R. P. Fairlie, Inspector, P.C. Chambers, Greenock, on payment of 1*l.* 1*s.* Plans may be inspected, and further particulars given, at the office of the engineer, Mr. T. Crichton Fulton, 44, West George-street, Glasgow.

AUGUST 27.—**South Molton.**—STEAM ROLLERS.—The South Molton R.D.C. invite tenders for the hire of three steam road-rollers from October 1 next. Mr. Fred Day, Clerk.

AUGUST 29.—**Blandford.**—STEAM ROLLING.—Blandford R.D.C. invite tenders for the work of steam rolling the District roads during the half year ending March 31, 1908. For forms of tender and other particulars apply to Mr. Edward Phelps, District Surveyor, Blandford.

SEPTEMBER 2.—**Steyning.**—HORSE HIRE.—Steyning West R.D.C. invite tenders for horse hire in the several parishes of the district. Specification and conditions and form of tender can be obtained on application to Mr. Edward Cripps, Solicitor, Clerk to the Council, Council Offices, Ham-road, New Shoreham.

SEPTEMBER 2.—**Steyning.**—ROAD ROLLERS.—Steyning West R.D.C. invite tenders for the hire of two steam road rollers and scarifier. Specifications and forms of tender can be obtained of Mr. Frederick Slaughter, A.M.Inst.C.E., Surveyor to the Council, High-street, Steyning.

SEPTEMBER 3.—**Bermondsey.**—SLOP-VANS AND WATER-VAN.—The B.C. invite tenders for the supply of two London-made slop-vans and one London-made water-van. Specifications and particulars can be obtained of Mr. R. J. Angel, M.Inst.C.E., Borough Surveyor.

SEPTEMBER 7.—**Camberley.**—STEAM ROLLER.—Frimley U.D.C. invite tenders for supplying or hiring of 12-ton steam rollers. Further particulars can be obtained from the Council's Surveyor, Mr. T. Clement Jones, C.E., Municipal Buildings, Camberley.

NO DATE.—**Bacup.**—CARTING.—Carting of about 2,500 tons of cast-iron pipes and valves from Bacup, Stacksteads, and Waterfoot Stations, Lancashire and Yorkshire Railway. For particulars and appointment apply to Mr. G. W. Deakin, Glenville, Waterfoot, near Manchester.

NO DATE.—**Westbourne.**—CARTING.—Westbourne R.D.C. invite tenders for the carting of flints from the several depôts on to the roads in their district. For forms of tender and further particulars apply to Mr. H. Morris, surveyor, West Ashling, Chichester.

PAINTING, etc.

AUGUST 15.—**Banbury.**—PAINTING, ETC.—Banbury T.C. invite tenders for painting and decorating the Police-court and other portions of the Municipal Buildings. Specification can be seen, and other information obtained, on application at the Borough Accountant's Office.

AUGUST 19.—**Bristol.**—DISTEMPERING, ETC.—Bristol Guardians invite tenders for distempering, painting, papering, etc., at the Downend Cottage Homes in accordance with specification, which is deposited for inspection at the said homes. Forms can be obtained at office of Mr. J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital, Bristol.

AUGUST 21.—**Cockett, Swansea.**—PAINTING.—Swansea Guardians invite tenders for painting or distempering at Cottage Homes, Cockett, in accordance with specification to be seen at Union Offices, Alexandra-road, Swansea.

AUGUST 21.—**Hull.**—PAINTING.—For painting certain works at Paull Point Battery, near Hull. Names to the Commanding Royal Engineer, 13, Belle Grove-terrace, Newcastle-on-Tyne.

AUGUST 28.—**Rochdale.**—PAINTING.—Rochdale General Purposes Committee invite tenders for painting required to be done on the outside of the Town Hall. Further particulars may be had on application to Mr. S. S. Platt, Borough Surveyor, Town Hall.

AUGUST 29.—**Mickleover.**—PAINTING.—The Committee of the Derby County Asylum invite tenders for the proposed painting of three wards and part of the outside buildings, also distempering and limewashing. Specifications may be obtained from Mr. A. McWilliams, Resident Engineer.

AUGUST 30.—**Levenshulme.**—PAINTING, ETC.—Levenshulme U.D.C. invite tenders for the painting and decorating required to the interior of the Council's Offices, Stockport-road, Levenshulme. Specification and form of tender may be obtained on application to Mr. James Jepson, Guardian-chambers, Tiviot Dale, Stockport, Surveyor to the Council.

ROADS, SANITARY, AND WATER WORKS.

AUGUST 19.—**Cannington, Bridgwater.**—CANNINGTON WATER SUPPLY.—The T.C. of Bridgwater invite tenders for the various works required to be executed in the laying of a cast-iron water pipe, 3 in. diameter, for about 3,186 lineal yds., in connexion with a water supply to the village of Cannington. The plans and specification may now be seen, and bills of quantities and forms of tender obtained, at the offices of the Borough Surveyor, Municipal Buildings, High-street, Bridgwater.

AUGUST 20.—**Chadderton.**—STREET WORKS.—Chadderton U.D.C. invite tenders for the works required to be done in sewering and completing Bamford-street, Sefton-street, and Industry-street. Forms of tender may be obtained on application at the Surveyor's office, Town Hall, Chadderton.

AUGUST 22.—**Rhondda.**—SEWERS, ETC.—Rhondda U.D.C. invite tenders for the following works, viz.:—(1) Laying about 320yds. of 9-in. sewer at Ynyshir; (2) laying about 330yds. of 12-in. surface water drain at Blaenclydach; (3) paving footpaths, kerbing, and channelling about 700 lin. yds. at Treorchy. Plans may be seen, and specifications and forms of tender obtained, at the Council Offices, Pentre.

AUGUST 24.—**Litherland.**—PAVING, ETC.—The U.D.C. of Litherland invite tenders for flagging, kerbing, etc., portion of Bridge-road, between Penrhyn-avenue, and a point 362 ft. north-east. Plans and specification can be seen, quantities and form of tender obtained, on application to Mr. A. H. Carter, Surveyor, Public Offices, Sefton-road, Litherland.

AUGUST 24.—**Longton.**—TAR PAVING.—Longton Corporation invite tenders for tar paving for walks at the Queen's Park. Specification and other particulars may be obtained from Mr. J. W. Wardle, A.M.Inst.C.E., Borough Surveyor.

AUGUST 24.—**Purton Stoke.**—WATER SUPPLY.—Cricklade and Wootton Bassett R.D.C. invite contractors to submit a schedule of prices for excavating the approach and driving and close timbering a heading and other works in connexion therewith at Pavenhill, Purton (Wilts). The specification may be seen, and a copy of the schedule obtained, at the office of the engineer, Mr. F. Redman, 34, Wood-street, Swindon.

✱ AUGUST 26.—**Coventry.**—PIPE-LAYING.—The Corporation of Coventry invite tenders for laying about eight miles of 20-in., and four miles of 16-in., internal diameter, cast-iron socket pipes. For further particulars refer to an advertisement in this issue.

AUGUST 26.—**Halifax.**—SEWER.—Halifax Highways Committee invite tenders for the construction of a 12-in. pipe sewer in Upper Washer-lane. Plans and specifications may be seen, and form of tender obtained, on application to Mr. James Lord, C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1*l.*

AUGUST 26.—**Leeds.**—PAVING, ETC.—Leeds Highways Committee invite tenders for the paving and flagging of streets. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road.

AUGUST 27.—**Bootle.**—SEWERS.—Bootle Corporation invite tenders for the construction of a brick sewer and pipe sewers. Particulars may be obtained at the office of Mr. B. J. Wolfenden, A.M.Inst.C.E., Borough Engineer, Town Hall.

AUGUST 27.—**Gateshead.**—PAVING, ETC.—Gateshead Corporation invite tenders for paving, etc., streets. Plans and specifications may be seen, and quantities obtained, at the office of Mr. N. P. Pattinson, Borough Engineer, Town Hall, Gateshead.

AUGUST 27.—**Woodford.**—ROAD WORKS.—Woodford U.D.C. invite tenders for the supply of materials and the necessary work required to be done in making-up the approach road at the Eastern Sewage Works. Plans and specification may be seen, and bills of quantities and form of tender obtained, on application to Mr. William Farrington, Surveyor to the Council, Council Offices, Woodford Green, upon deposit of 1*l.* 1*s.*

AUGUST 29.—**Chepping Wycombe.**—SURFACE-WATER DRAIN, LONDON-ROAD.—For the laying of a stoneware pipe surface-water drain in London-road. Plan and specification may be seen, and quantities and forms of tender obtained, at the office of Mr. T. J. Rushbrooke, Borough Surveyor, High Wycombe.

AUGUST 31.—**Earsdon.**—SEWER.—Earsdon U.D.C. invite tenders for the execution of the necessary work in connexion with the laying of a 12-in. sewer. Full particulars, plans, and specifications, together with bills of quantities and form of tender, may be seen at the office of the surveyor on personal application to Mr. J. R. MacMillen, Council Building, Shiremoor, between the hours of 9 a.m. and 10 a.m. on the payment of a deposit of 3*l.*

SEPTEMBER 2.—**Servia.**—EARTH WORKS.—The C.C. of the County of Podrinye (Servia) invite tenders for the construction of the earth works of the first section of the railway line Shabatz-Banya Koviyatcha, the length of the said line being 30 kilo-

metres. A bond of 33,000 dinars must be deposited at the Treasury of the County of Podrinye, in cash, State bonds, or other securities which are guaranteed by the State. Plans, profiles, estimates, and conditions can be seen in the office of the County Council.

* SEPTEMBER 3.—**Bromley-by-Bow.**—GRANOLITHIC PAVING.—The Managers of the Poplar and Stepney Sick Asylum District invite tenders for certain granolithic paving at the Sick Asylum, Devons-road, Bromley-by-Bow, E. For further particulars refer to an advertisement in this issue.

* SEPTEMBER 4.—**Kingston-on-Thames.**—ROAD-MAKING.—The Corporation of Kingston-on-Thames invite tenders for levelling, paving, metalling, flagging, channelling, sewering, and lighting a portion of Dudley-road. For further particulars refer to an advertisement in this issue.

SEPTEMBER 10.—**Southampton.**—ROAD WORKS.—Southampton Corporation invite tenders for executing the following works, viz.:—(1) Kerbing, channelling, and storm-water drainage; (2) removal of sewer pipe from River Itchen. Plans, specifications, and conditions may be inspected, and forms of tender and bills of quantities obtained, at the Borough Engineer's Office, upon production of the Borough Treasurer's receipt for a deposit of 2*l.* 2s. in respect of each contract.

STONE, MATERIALS, AND STORES.

AUGUST 19.—**Belfast.**—TIMBER.—Belfast Harbour Commissioners invite tenders for the supply of a quantity of sawn pitch pine, Greenheart, and American rock elm timber, particulars of which, with form of tender, may be obtained from the Harbour Engineer, Mr. W. Redfern Kelly, M.Inst.C.E.

AUGUST 20.—**London.**—AXLES, ETC.—Bombay, Baroda, and Central India Railway Company Directors invite tenders for the supply of the following stores, viz.:—(1) Steel axles for carriages and wagons; (2) steel materials; (3) miscellaneous tools and stores. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Secretary, offices, Gloucester House, 2, 3, and 4, Bishopsgate-street Without, London, E.C., on payment of 1*l.* 1s. each (which will not be returned).

AUGUST 21.—**Leeds.**—PAINT, ETC.—Leeds Improvements Committee invite tenders for the supply of paint and painters' materials required up to March 31, 1908. Forms of tender and schedules may be obtained from Mr. W. T. Lancashire, City Engineer, Municipal Buildings, Leeds, on payment of a deposit of 1*l.* 1s.

AUGUST 21.—**London.**—ARTICLES, ETC.—The East Indian Railway Company invite tenders for the supply and delivery of (1) files; (2) white metal ingots; (3) pig iron; (4) galvanised sheets, etc.; (5) traversing jacks; (6) miscellaneous tools, as per specifications to be seen at the Company's offices. For each specification a fee of 1*l.* 1s. is charged, which cannot under any circumstances be returned.

AUGUST 24.—**Windsor.**—TIMBER.—Windsor Guardians invite tenders for the supply of yellow deal and batten ends with square edges for twelve months. Further particulars can be obtained on application to the Master of the Workhouse, Old Windsor.

AUGUST 26.—**Teddington.**—GRANITE.—The U.D.C. of Teddington invite tenders for the supply of granite kerb, channel setts, etc., delivered at Teddington Railway Station or at the Draw Dock in Ferry-road, Teddington. Mr. G. H. Salmons, Clerk, Elmfield House, Teddington.

AUGUST 27.—**Stamford.**—GRANITE.—The T.C. of Stamford invite tenders for about 500 tons of X and 500 tons of XX broken granite. Mr. Fredk. R. Ryman, A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Stamford.

SEPTEMBER 2.—**Arundel.**—FLINTS.—Arundel T.C. invite tenders for the supply and delivery of 200 cubic yds. of clean, hand-picked flints. Forms of tender may be obtained on application to Mr. E. F. Farrington, Borough Surveyor, Town Hall, Arundel.

SEPTEMBER 2.—**Hampton.**—MATERIALS.—Hampton U.D.C. invite tenders for the supply of gully grates, road-sweeping machine, and bass brooms. Forms of tender, conditions, and all particulars can be obtained from Mr. Sidney H. Chambers, Surveyor to the Council, at the offices of the Council, Hampton, Middlesex.

SEPTEMBER 3.—**Bridgend.**—SUPPLIES.—The Committee of Visitors of the Glamorgan County Asylum invite tenders for the supply and delivery of material for masons, engineers, and painters for periods of three and six months from October 1, 1907. Forms of tender and any information may be obtained on application to the Clerk and Steward.

SEPTEMBER 7.—**Camberley.**—FLINTS.—Frimley U.D.C. invite tenders for the supply of 2,158 cubic yds. of large flints. Particulars and form of tender may be obtained on application to Mr. T. Clement Jones, C.E., Engineer and Surveyor to the Council, Municipal Buildings, Camberley, on payment of 2*l.* 2s.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*CLERK OF WORKS	Carlisle Education Com.	3*l.* 3s. per week	Aug. 19
*ENGINEER AND CLERK OF WORKS	Kent County Lunatic Asylum	110*l.*, etc., per annum	Aug. 31
*QUANTITY SURVEYOR	St. Pancras Borough Council	See advertisement in this issue	Sept. 11

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDING MATERIAL, 37 AND 38, ST. JAMES-STREET—On the Premises	Horne & Co.	Aug. 21
*QUARRY PLANT, MACHINERY, ETC., IRELAND—Quarries, Doonagore	Matcham & Co.	Sept. 18

Patents of the Week.

APPLICATIONS PUBLISHED.*

15,907 of 1906.—I. TRAUBE: *Processes for Imitating the Pattern of Natural Stones and the like.*

THIS relates to a process of imitating the patterns of natural stones and the like. A solution of colloidal substances containing a salt is poured on a suitable surface, and after the solution has become solid or semi-solid an aqueous solution of a salt capable of forming precipitates with the first-named salt is brought into contact with the first-named layer and dried.

15,914 of 1906.—R. G. HOWSON: *Hot and Cold Water Mixing Valves for Baths and the like.*

This relates to a bath supply fitting provided with means whereby the maximum temperature of the water supplied may be permanently determined, and consists in the provision of an adjusting valve in connexion with each of the main valves.

17,625 of 1906.—G. P. MESSENGER: *Corrugated Metal Sheets for Iron Buildings and Skylights.*

This relates to corrugated metal sheets for iron buildings, in which the corrugations taper off to a flat part or parts, from which a jointless curb is stamped or pressed up or otherwise forced to assume the desired formation.

20,823 of 1906.—E. W. BEECH: *Norfolk Latches and the like.*

This relates to Norfolk latches and the like, and consists in providing the latch-bar with means so that the latch-bar after being lifted and moved end-on can be held free of the lift-bar so that such lift-bar cannot move the latch-bar, the latch-bar being also provided with a projection angled or not, which when the latch-bar is lifted and moved forwards towards the catch, engages the catch and holds the latch-bar clear of the lift-bar.

21,810 of 1906.—J. GROVES: *Windows.*

This relates to a window in which the lower and upper sashes have free vertical movement in their respective guides, but when in their highest and lowest position respectively may be swung inwardly, and in which each sash is provided with a pair of sockets adapted to engage and co-operate with a pair of pivots attached to the jamb so as to form a hinge, and consists in providing a projection on one part of each hinge adapted to engage with a slot formed in the other part.

22,957 of 1906.—N. RAMSAY: *Latches or Locks for Sliding-doors and the like.*

This relates to a latch or lock for sliding-doors and the like in which a pivoted and hooked bolt that does not protrude beyond the latch or lock structure is housed within a shield or surrounding casing into which a box-like striking plate is adapted to enter.

24,012 of 1906.—J. MURRAY: *Work-feed for Circular and Other Saws.*

This relates to a mechanical feed for circular and other saws, and is chiefly applicable to the working of swage and ground-off saws. The feed, complete with iron fence, can be fitted to any saw bench. It consists of a steel feed-block driven by an endless chain and travelling in a slotted fence flush with face of same. A hardwood block is fitted into the feed-block with pinching pins, and is made to project about 1 in. from face of fence so that material to be sawn can be carried forward to the saw. The endless chain then passes around a driving pulley and over a tension bar, and when slack runs free. By putting pressure on the tension bar the chain becomes tight and grips the feed-block, carrying it forward. When the pressure is removed the feed-block automatically drops back to its original position, the recovery being caused by a weight fixed to the feed-block by a chain or rope which passes over a pulley at the back of the fence.

24,641 of 1906.—H. H. WALSH: *Brick-making Machine.*

This relates to a brick-making and drying plant comprising a discharge conduit containing a plunger for forcing material into moulds formed by linked conveyor-strips provided with fixed and transverse walls and movable walls between the said strips, the said movable walls being lowered to discharge the bricks from the moulds on to plates conducting said bricks to a drier.

26,891 of 1906.—D. C. BRUCE: *Gantry Cranes and Elevators.*

This consists in the combination and arrangement in one structure of a gantry crane, an elevator or elevators and a conveyor or conveyors, the elevator or elevators being mounted upon the outer sloping end or ends of the gantry structure and delivering to a conveyor or conveyors so carried by the gantry structure that the delivery part thereof is capable of being raised or lowered.

1,848 of 1907.—L. FREDERIKSEN: *Adjustable Scaffolds.*

This relates to a safety scaffold with supporting chains or ropes carrying the vertically adjustable working platform, and consists in the top piece being divided by a hinge or the like into two parts pivoted into one another but rigidly connected each to one of the mast tops, so that the masts the base and the top piece together form a rigid and stable A-frame.

4,686 of 1907.—J. G. HOUDRET: *Apparatus for Heating Water.*

This relates to a water-heating device capable of being used as a bath heater comprising a gasolene reservoir furnished with baffle devices bearing suitable meshes, and into which the air to be carburetted is conveyed by a spring actuated or other kind of fan, the carburetted air being then consumed in a burner in the form of a grate.

5,069 of 1907.—J. SHANKS: *Siphon Cisterns for Flushing Water-closets.*

This relates to a siphon cistern wherein the displacer which starts the siphonic discharge of the water is actuated by a pivoted push or pull lever linked to a lever arm on the displacer pivot.

5,663 of 1907.—W. CLARKE: *Window Sashes.*

This relates to a window sash of the type adapted to open inwards so as to admit of being cleaned from the inside, and consists in the arrangement of a hinged upper sill provided with a tongue or projection on its under side adapted to engage in a groove in the window frame, and to make the window air, dust, and water tight when closed, and when turned back to admit of the window being opened.

5,949 of 1907.—E. KLEIN: *Safety Bar for Windows or the like.*

This relates to a safety bar for windows or the like, and is characterised in that a shell which is disposed in the window frame is provided with a rectangular slot into which the spring-influenced spindle of the bar proper projects with its pin in such a manner that the latter normally lies in the longitudinal part of the slot but is by means

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

of a detachable key, set on the free spindle end, adapted to be shifted into the transverse part of the slot thus disengaging the bar, the pin being normally prevented from shifting by means of a hooked spring projecting into the longitudinal part of said slot.

7,730 of 1907.—R. R. WOODCOCK: *Water-closets.*

This relates to water-closets, and has for its object to diminish the noise of flushing, and consists in combining with the usual air-inlet to the siphon a tight closure between the closet-seat and its lid and between the seat and the pan.

11,571 of 1906.—F. FRIER: *Machines for Breaking or Splitting Stone and the like.*

This relates to a stone-breaking and splitting machine, and consists in the arrangement of a stunning-tool and of a splitting tool in one and the same head or monkey.

13,881 of 1906.—M. N. RIDLEY and T. I. CAMMELL: *Reinforced Concrete Beams, Girders, Floors, Columns, Tunnel Linings, and the like.*

This relates to a reinforced concrete beam, girder, column, or the like, constructed with dovetail or the like sheeting, and having such sheeting closed down where it is attached to the angle-bars or the like in the structure.

16,010 of 1906.—C. A. MORRIS: *Apparatus for Ventilating Tunnels.*

This relates to a method of ventilating tunnels and similar chambers consisting in compressing foul air therein by a moving body, and in utilising said moving body to automatically operate normally closed exits for conveying said compressed foul air from the tunnel and to draw fresh air into the tunnel.

18,294 of 1906.—H. J. BATT and W. BOWDEN: *Method of Dressing or Grading China Clay.*

This relates to a method of dressing or grading china clay by a dry process which consists in submitting the material after being partially dried by hot air and screened through screens of about a ¼-in. mesh to a current of heated air while falling in a thin, wide stream upon finer and graded screens in motion, the heavier particles falling into open bins through said screens and the light particles being carried with the blast to different distances according to their weight or against stationary screens or baffles, and allowed to fall by gravity into separate receptacles.

25,243 of 1906.—H. G. KEYWOOD: *Socket and Spigot Pipes, such as Water Pipes, Gas Pipes, Drainage or Sanitary Tubes, and the like.*

This relates to socket and spigot pipes, such as water pipes, gas pipes, drainage or sanitary tubes, and the like constructed with two or more concentric part bands or belts at the spigot end in the form of a flange having recesses or spaces therein. Within the socket end of each pipe are projections or keys corresponding to the recesses on the spigot end and in such relative position that when the latter is placed within its recesses are opposite to the keys or projections within the socket of the joining-pipe, and when pushed into the socket and then partially turned the projecting portions or part flanges of the spigot pass behind and become interlocked with the projections or keys in the socket.

27,232 of 1906.—G. W. NAYLOR and J. F. NAYLOR: *Arched Tiles for Filter-beds and the Like.*

This relates to arched tiles for filter-beds and the like having at one or both ends projections adapted for bridging over the spaces left between the tiles when laid, in such a manner as to form a continuous track of uniform width along the tops of a line of the said tiles.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, and Canada 21s. 8d. (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," 4, Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post.*

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 1.—By TUCKETT & SON (at Sheerness).
Sheerness.—Carona-rd., 54 freehold plots £1,583
Marine-parade, f.g. rents 173*l.* 12*s.* reversion in 46 yrs. 4,217

By WINTERTON & SONS (at Rugeley).
Kings Bromley, Staffs.—Aston Hayes Farm, 78½ acres, f. 3,000

August 2.—By DAVID PRICE (at Brecon).
Talgarth, Brecon.—Bronollys Castle Estate, 142 acres, f. 11,385

By ELLIOTT, ELLIS & CO. (at Tavistock).
Thrushelton, Devon.—Lewdown Cottages and 12 acres, f. 420

August 6.—H. J. CHEFFINS (at Saffron Walden).
Wimbish, Essex.—Lower House Farm, 129 a. 3 r. 9 p., f. £1,400
Ashdon, Essex.—Woodstone and Spriggs Farms 93 a. 3 r. 11 p., f. 1,450

Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETING.

WEDNESDAY, AUGUST 21.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

***** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.**

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 7 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	" " "
Picked Stocks for Facings	2 10 0	" delivered.
Flettons	1 6 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	28 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	

	s. d.	
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2 10	"
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	
3 in. sawn two sides slabs (random sizes)	0 11½	"
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	"
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	"
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	" "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do. pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	... 18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
" " 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.		£ s. d.
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	...	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	...	12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	...	22 10 0
Do. 3 in. by 9 in.	18 0 0	...	19 10 0
Battens	13 10 0	...	15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	...	17 0 0
Do. 3 in. by 9 in.	14 10 0	...	16 0 0
Battens	11 0 0	...	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	...	14 0 0
Do. 3 in. by 9 in.	12 10 0	...	14 0 0
Battens	10 0 0	...	11 0 0
White Sea and Petersburg—			
First white deals, 3 in. by 11 in.	14 10 0	...	15 10 0
" " 3 in. by 9 in.	13 10 0	...	14 10 0
Battens	11 0 0	...	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	...	14 10 0
" " 3 in. by 9 in.	12 10 0	...	13 10 0
" " battens	10 0 0	...	11 0 0
Pitch-pine: deals	18 0 0	...	21 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0		upwards.
Oddments	32 0 0		"
Seconds, regular sizes	33 0 0		"
Yellow Pine oddments	28 0 0		"
Kauri Pine—Planks, per ft. cube	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs—			
Large, per ft. cube	0 3 0	...	0 3 6
Small " "	0 2 6	...	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	...	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	...	0 0 ½
¾ in. do. do	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	...	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	17 0 0	...	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	...	0 5 0
Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 0
¾ in. by 7 in. white " "	0 10 0	...	0 11 6
1 in. by 7 in. " " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 7 6	...	7 15 0
Compound Girders, ordinary sections	9 10 0	...	10 10 0
Steel Compound Stanchions	12 5 0	...	13 5 0
Angles, Tees, and Channels, ordinary sections	9 5 0	...	10 5 0
Flitch Plates	9 5 0	...	10 5 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	...	9 0 0

METALS.

	Per ton, in London. £ s. d.		£ s. d.
IRON—			
Common Bars	8 10 0	...	9 0 0
Staffordshire Crown Bars, good merchant quality	9 5 0	...	9 15 0
Staffordshire "Marked Bars"*	11 0 0	...	—
Mild Steel Bars	9 10 0	...	9 15 0
Hoop Iron, basis price	9 15 0	...	10 0 0
" " Galvanised	17 10 0	...	—
(*And upwards, according to size and gauge.)			
Sheet Iron Black—			
Ordinary sizes to 20 g.	10 0 0	...	—
" " 24 g.	11 0 0	...	—
" " 26 g.	12 10 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	16 10 0	...	—
" " 26 g.	17 0 0	...	—
Sheet Iron, Galvanised, flat, best quality—			
Ordinary sizes to 20 g.	19 0 0	...	—
" " 22 g. and 24 g.	19 10 0	...	—
" " 26 g.	21 0 0	...	—
Galvanised Corrugated Sheets—			
Ordinary sizes 6 ft. to 8 ft. 20 g.	16 0 0	...	—
" " 22 g. and 24 g.	16 5 0	...	—
" " 26 g.	17 10 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	14 0 0	...	—
" " 26 g.	16 0 0	...	—
Cut Nails, 3 in. to 6 in.	10 15 0	..	11 5 0
(Under 3 in., usual trade extras.)			

LEAD, &c.

	Per ton, in London £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up.	23 5 0	...	—
Pipe in coils	23 15 0	...	—
Soil pipe	25 15 0	...	—
Compo pipe	26 15 0	...	—
ZINC—Sheet—			
Vieille Montagne ton	33 0 0	...	—
Silesian	32 15 0	...	—
COPPER—			
Strong Sheet per lb.	0 1 4	...	—
Thin "	0 1 5	...	—
Copper nails "	0 1 3	...	—

LEAD, &c. (*continued*).

	£ s. d.		£ s. d.
BRASS—			
Strong Sheet per lb.	0 1 2	...	—
Thin "	0 1 3	...	—
TIN—English Ingots "	0 1 11	...	—
SOLDER—Plumbers' "	0 0 9	...	—
Tinmen's "	0 0 11	...	—
Blowpipe "	0 1 1	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft.	delivered.
" fourths	1⅞d.	"	"
21 oz. thirds	3⅛d.	"	"
" fourths	2⅜d.	"	"
26 oz. thirds	4¼d.	"	"
" fourths	3¼d.	"	"
32 oz. thirds	5d.	"	"
" fourths	4⅛d.	"	"
Fluted Sheet, 15 oz.	3⅛d.	"	"
" 21 oz.	4⅛d.	"	"

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

¼ Hartley's	2½d.	per ft.	delivered.
⅜ "	2¾d.	"	"
½ "	3d.	"	"
Figured and Oxford Rolled "Oceanic" Glass, white	4d.	"	"
Do. " tinted	5½d.	"	"

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 2
" " " in barrels	"	0 2 3
" " " in drums	"	0 2 5
Boiled " " in pipes	"	0 2 4
" " " in barrels	"	0 2 5
" " " in drums	"	0 2 6
Turpentine in barrels	"	0 3 5
" in drums	"	0 3 7
Genuine Ground English White Lead	per ton	27 0 0
Red Lead, Dry	"	24 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCII. (January to June, 1907) was given as a supplement with the issue for July 13.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings price 9d. each,

THE NINETY-SECOND VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

Four lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

. Stamps *must not* be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office, 4, Catherine Street, Covent Garden, W.C., free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted.* † Denotes *provisionally accepted.***

ALPINGTON and YELVERTON.—For addition to Alpington and Yelverton school, for the Norfolk Education Committee. Quantities by architect:—

Dowe	£240 0 0	Tofts	£228 19 8
Watson & Kirby	240 0 0	Downing & Sons	227 0 0
Scarlet Bros.	238 0 0	Lincoln	218 0 0
Podd & Fisher	232 0 0	Stowers*	210 0 0

ARKLEY.—For alterations and additions to house, "Mount Alyn," Arkley, near Barnet. Mr. J. W. Abraham, architect, 80, Hanley-road, Stroud Green, N.:—

G. L. Kirby	£1,146	Mattock & Parsons, 165, Gray's Inn-road, W.C.	£835
Grover & Son	1,073		

BOREHAM (Essex).—For erecting a small villa. Mr. R. Mawhood, architect, Chelmsford:—

Allen & Gowers, Chelmsford* £550

BRADFORD.—For constructing a new road near Shipley Glen, for Lt.-Col. Maude. The Fleets, Ryistone, near Skipton. Messrs. W. B. Woodhead & Son, surveyors, 18, Exchange-buildings, Bradford:—

J. Robinson, 57, Thompson-street, Shipley ..... 4s. 11d. per lineal yard.

BRAMPTON.—For erecting new mixed secondary school, for Cumberland Education Committee. Messrs. Grayson & Ould, architects, 31, James-street, Liverpool. Quantities by Mr. J. H. Harris, 31, James-street, Liverpool:—

J. Heward, Brampton, Cumberland £2,920

BRENTFORD.—For reconstruction of Percy House schools drainage, for the Guardians. Mr. W. C. Tyndale, M.Inst.C.E., 2, Old Queen-street, Westminster, S.W.:—

W. Ward	£1,350 0 0	Speechley & Smith	£1,075 0 0
J. H. Wakelin	1,255 0 0	C. Wall, Ltd.	1,050 0 0
J. Dorey & Co., Ltd.	1,225 0 0	A. H. Inns	1,038 0 0
Fenns Bros.	1,192 0 0	W. J. Dickens,	
S. Kavanagh & Co.	1,191 2 0	The Broadway, Ealing*	1,023 0 0
G. Jennings, Ltd.	1,180 17 6	T. Bendon, Ltd.	1,004 0 0
W. Johnson & Son, Ltd.	1,124 0 0	W. Rice & Sons	950 2 10
		J. S. Selway	897 0 0

BURNHAM (Somersetshire).—For 450 lineal yards of 12 in., and 180 yds. of 9 in. stoneware pipe sewerage, for the Urban District Council. Mr. W. H. Chowins, Engineer, Public Offices, Burnham:—

E. Preece	£793 0 0	S. Ambrose	£599 7 6
J. Coles & Son	708 0 0	G. Pollard & Co. Taunton*	585 2 11
W. J. Pople	699 19 3		
E. Ireland	698 0 0		

CARLISLE.—For erecting a new girls' secondary school, for Cumberland Education Committee. Messrs. Grayson & Ould, architects, 31, James-street, Liverpool. Quantities by Mr. J. H. Harris, 31, James-street, Liverpool:—

J. & R. Bell, Nelson-street, Carlisle £11,708 4 6

CAVERSHAM.—For erecting stables, cart-sheds, masons' shed, etc., at depôt in Harley-road, for the Urban District Council. Mr. A. J. Smith, surveyor, 11, Bridge-street, Caversham:—

R. Curtis	£1,998 0 0	W. Stokes & Sons	£1,668 17 0
J. Wilcox	1,995 15 5	Lewis Bros.	1,600 13 8
R. F. McCarthy	1,745 0 0	R. Bell & Sons	1,570 11 1½
H. W. Goodwin	1,699 17 0	F. T. Robinson	1,532 8 0
W. H. Holden	1,680 11 6	Batten Bros.	1,520 0 0
C. H. Faulks & Co.	1,670 11 4	H. A. Wyeth, Cavendish*	1,439 11 5

CLIFTON.—For conversion of property into five cottages, for Mr. W. Irving. Messrs. Stoker & Nicholson, architects and surveyors, Old Town Hall, Washington-street, Workington:—

J. W. Fitzsimons, Ellenborough, Maryport. £340

CROOKSTOWN (Ireland).—For the erection of a new roof on Moveddy Church, Co. Cork. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

W. J. O'Mahony, Ard. Barry, Magazine-road, Cork £308

EBBW VALE.—For erecting West-end Congregational church, for the committee. Mr. H. Waters, architect, Ebbw Vale and Beaufort:—

D. Morgan	£2,252 13 10	T. Evans	£2,183 17 0
J. Morgan	2,230 15 0	D. J. Vaughan, Tredegar*	2,155 0 0
S. J. Wride	2,200 0 0		

ECCLES.—For painting and decorating the Council Chamber, etc., at the Town Hall, for the Corporation:—

Lomax Bros., Market place, Eccles £140

EXMOUTH.—For buildings, retaining walls, and foundations of destructor at Mudbank, for the Urban District Council. Mr. S. Hutton, Surveyor and Engineer. Quantities by the Surveyor and Engineer:—

No. 1 *Contract.—Buildings, Retaining Walls, etc.*
R. C. Cooper, 14, The Beacon, Exmouth* £950

No. 2 *Contract.—Destructor. Disinfector, Connexion to and Lining Chimney.*
Meldrum Bros., Timperley, Manchester* £2,064 10

No. 3 *Contract.—Ironfounder and Smiths Work.*
Harrison & Colmer, Milk-street, Bristol* £259 15 3

No. 4 *Contract.—Electrical Installation.*
(Not yet settled.)

GAINSBOROUGH.—For the extension of the market buildings, for the Urban District Council. Mr. S. W. Parker, engineer and surveyor, Gainsborough:—

S. Pumfrey, Gainsborough* £6,875

GALLEYWOOD (Essex).—For erecting a cottage. Mr. R. Mawhood, architect, Chelmsford:—

J. Gowers	£340	Allen & Gowers Chelmsford*	£288
Baker & Sons	292		

HARROW.—For the erection of New Baptist Church, College-road, Harrow-on-the-Hill. Messrs. McKilliam & Procter, architects, 83, St. Paul's Churchyard, London, E.C. Quantities by the architects:—

—	—	Estimate "B."	—
	£	£	Months.
Battley, Sons, & Holness	5,583	272	9
Thomas & Edge	5,550	268	10
E. A. Room & Co.	5,498	260	8
T. H. Kingerlee & Sons	5,481	271	8
E. J. Saunders	5,400	298	9
Ford & Walton	5,395	200	7
Courtney & Fairbairn	5,391	271	8
J. Jarvis & Sons	5,350	290	6 to 8
Peacock Bros.	5,349	269	—
J. Smith & Sons, Ltd.	5,285	285	8
C. Ansell	5,275	280	10
Chinchen & Co.	5,198	257	7
Mattock Bros., Wood Green*	4,979	247	5 to 6

HEATH TOWN.—For Prestwood-road and Church-street improvement, for the Urban District Council. Messrs. Berrington, Son, & Martin, engineers, Bank-buildings, Wolverhampton:—
W. H. Reading, Fawdry-street, Wolverhampton £178

HEREFORD.—For taking down two old cottages, Nos. 41 and 42, Catherine-street, Hereford, and rebuilding two new cottages on the site. Mr. Herbert Skyrme, architect, Hereford:—
W. Powell, Builder, Hereford* £329

HOLMFIRTH (Yorks).—For 4,000 yds. of sewers, for the Urban District Council. Messrs. J. Barrowclough & Son, Holmfirth, and Messrs. Beesley, Son, & Nichols, 11, Victoria-street, Westminster, Engineers:—
R. Turner, Back-lane, Holmfirth* .. £2,290 7 6
[Lowest out of seven.]

HULL.—For erecting a greenhouse in the West Park, Anlaby-road, for the Parks and Burial Committee. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

F. R. Southern	£195 5 0	W. Sanderson Hull*	£183 15 0
G. Jackson & Sons	188 6 6		

HUTTON.—For erecting country house, Byron-road, Hutton, Essex, for Mr. Arthur Burns. Mr. Hugo R. Bird, architect, St. Thomas'-gate, Brentwood, Essex:—

Dowsing & Davis	£836 0	F. W. Jarvis	£695 0
F. W. Burtwell	715 0	J. W. Parish*	621 10

LLANDAFF.—For additions to "Pen pentre," Llandaff. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2, Church-street, Cardiff:—

F. Small	£5'0 0 0	W. H. Evans	£409 0 0
Blacker Bros.	452 14 0	King & Co.	395 3 4
E. D & W. Evans	442 0 0	W. Cox	394 0 0
Cox & Barls	419 0 0	J. H. Maggs & Co., Cardiff*	386 12 0
D. Davies	416 0 0		

LLANDAFF.—For the erection of detached villa at Llandaff and construction of roads and sewers. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2, Church-street, Cardiff:—

	House.	Roads, etc.
Pye, Parkinson, & Co., Swansea	£982 16 10*	£276 7 0
W. T. Morgan	1,050 0 0	—
J. H. Maggs & Co.	1,102 18 0	313 19 0
D. Davies	1,120 0 0	—
W. Symonds & Co.	1,124 18 6	421 9 0
W. Williams	1,145 0 0	307 0 0
E. T. Bevan	1,172 0 0	300 0 0
J. Allan & Sons	1,237 0 0	387 0 0
E. Turner & Sons	1,262 0 0	375 0 0
W. H. Evans	1,280 0 0	360 0 0
S. Shepton & Sons	1,335 0 0	—
Barnes, Chaplin, & Co	—	273 10 0
G. L. Morgan	—	313 7 1
Mackay & Davies, Cardiff	—	273 0 0*

LONDON.—For the erection of a new police-station at Wapping. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police, New Scotland-yard, S.W. Quantities by Messrs. Thurgood, Son, & Chidgey, Charing Cross-chambers, Duke-street, Adelphi, W.C.:—

H. Lovatt, Ltd.	£14,441	Patman & Fotheringham	£13,953
Clarke & Bracey	14,419	Higgs & Hill	13,854
Holloway Bros.	14,348	Lathey Bros.	13,850
Lascelles & Co.	14,320	Mowlem & Co.	13,790
Dove Bros.	14,302	Godson & Son	13,575
Harris & Wardorp	14,188	C. Ansell	13,460
F. & F. H. Higgs	14,168	Lawrence & Sons	13,440
Kilby & Gayford	14,044		
Grover & Son	13,989		

MOORTHORPE.—For erecting a new hotel at Moorthorpe, South Elmsall, for Messrs. the Carters' Knottingley Brewery Co., Ltd. Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford:—
Brick and Woodwork: F. H. & T. W. Moore, Shirebrook, near Mansfield* £1,727 0 11
Plumbers: E. Walker & Co., Heckmondwike* 169 10 0
Slaters: Stewart Bros., Pontefract* 101 0 0
Plasterer: J. Shaw, Pontefract* 124 15 0
Painter: S. Harrison, Pontefract* 45 10 0

NEVENDEN (Essex).—For alterations, etc., the "Jolly Cricketers" inn. Mr. R. Mawhood, architect, Chelmsford:—

J. Gowers	£153 10	Choat & Sons Chelmsford*	£129 0
I. Rayner	136 0		

QUAKERS' YARD.—For building boundary walls, etc., at South Wales and Monmouthshire Truant School:—
E. Price, Builder, Treharris* £167 8 5

WAKEFIELD.—For erecting two houses and the formation of road at Flanshaw, Wakefield, for Messrs. Scott & Ashton. Mr. Arnold S. Nicholson, architect, City-chambers, Wakefield. Quantities by architect:—
Excavator, Bricklayer, and Masons, Work:
Bagnall Bros., Stanley-road, Wakefield.... £266 0 0
Carpenter and Joiner: W. Chappell, Horbury 154 6 0
Slaters: Sharp & Harper, Leeds 26 15 0
Plumber and Glazier: H. Gillott, Wakefield.. 66 17 6
Plasterer: H. Sanderson, Ossett 29 0 0
Painters: Goodall, Lister, & Goodall, Wakefield 10 0 0

WHITEHAVEN.—For erecting new mixed secondary school, for Cumberland Education Committee. Messrs. Grayson & Ould, architects, 31, James-street, Liverpool. Quantities by Mr. J. H. Harris, 31, James-street, Liverpool:—
Hughes & Stirling, Bootle, Liverpool.. £10,416 11 8

WILTON.—For new sanitary conveniences at the Royal Wilton Carpet Factory, Ltd., Wilton, near Salisbury. Messrs. Lemon & Blizard, MM.Inst.C.E., engineers, Salisbury, and 11, Victoria-street, S.W.:—

J. Whatley	£675	F. Burton	£370
Hewett & Sons	540	J. Douglas, Southampton*	354
J. Bolding & Sons	530		
Wort & Way	395		

W. H. Lascelles & Co.
LIMITED,
121, BUNHILL ROW, LONDON, E.C.
Telephone No. 1365 *London Wall.*
HIGH-CLASS JOINERY, LASCELLES' CONCRETE.
Architects' Designs are carried out with the greatest care.
CONSERVATORIES, GREENHOUSES, WOODEN BUILDINGS,
Bank, Office, and Shop Fittings,
CHURCH BENCHES & PULPITS.
ESTIMATES GIVEN ON APPLICATION.

The BATH STONE FIRMS, Ltd., BATH.
For all the Proved Kinds of
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

Ham Hill Stone.
Doulting Stone.
Portland Stone.
The Ham Hill and Doulting Stone Co., Limited
(Incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.).
Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

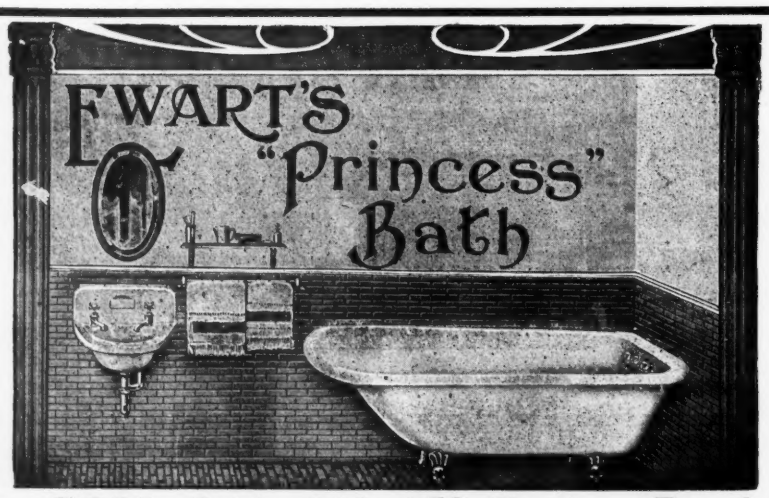
SPRAGUE & CO., Ltd.,
LITHOGRAPHERS,
Employ a large and efficient Staff especially for Bills of Quantities, &c.
4 & 5, East Harding-st., Fetter-lane, E.C.

QUANTITIES, etc., LITHOGRAPHED accurately and with despatch. [Telephone No. 434 Westminster.
METCHIM & SON {8, PRINCES STREET, S.W., and 32, CLEMENT'S LANE, E.C.
"QUANTITY SURVEYORS' DIARY & TABLES," For 1907, price 6d., post 7d. In leather, 1/-.

JOINERY
Of every description and in any kind of Wood.
CHAS. E. ORFEUR, LTD.,
ESTIMATES ON APPLICATION.
COLNE BANK WORKS, COLCHESTER.
Telephone: 0195. Telegrams: "Orfeur, Colchester."
LONDON OFFICE: 161, COMMERCIAL STREET

PILKINGTON & CO.
(ESTABLISHED 1838),
DEPTFORD WHARF
190, CREEK ROAD, DEPTFORD, S.E.
Telephone No. 831 Deptford.
Registered Trade Mark.
Polonceau Asphalte.
PATENT ASPHALTE AND FELT ROOFING.
ACID-RESISTING ASPHALTE, WHITE SILICA PAVING.
SEYSSEL ASPHALTE (*Direct from the Mines*

Princess Bath
As illustrated, is fitted with Patent Hot and Cold Taps, which cannot be bent or twisted. Porcelain Enamelled on inside and plain painted outside. Perfect rolled edge.
Price... £5 16 6.



Bath Room
Completely fitted with the Latest Novelties. Orders executed without delay. EWARTS' "LIGHTNING" GEYSERS for Hot Water Supply, Night or Day. Full particulars and Illustrated Catalogue, No. 55 Free.

EWART & SON Ltd. 346—350 Euston Road London N.W.

007.

BATH.

C.

ofing, and

Limited
k & Son,

set.
iams,

lic Lava
ffice, 42,
aterials
arehouse
nd milk-
terraces.
idge Co.

ially for

E.C.

PHED
ne No. 434
minster.
, S.W., and
NE, E.C.
ABLES,"
1/-.

Wood.

LTD.,
RKS,
TER.
ter."
REET

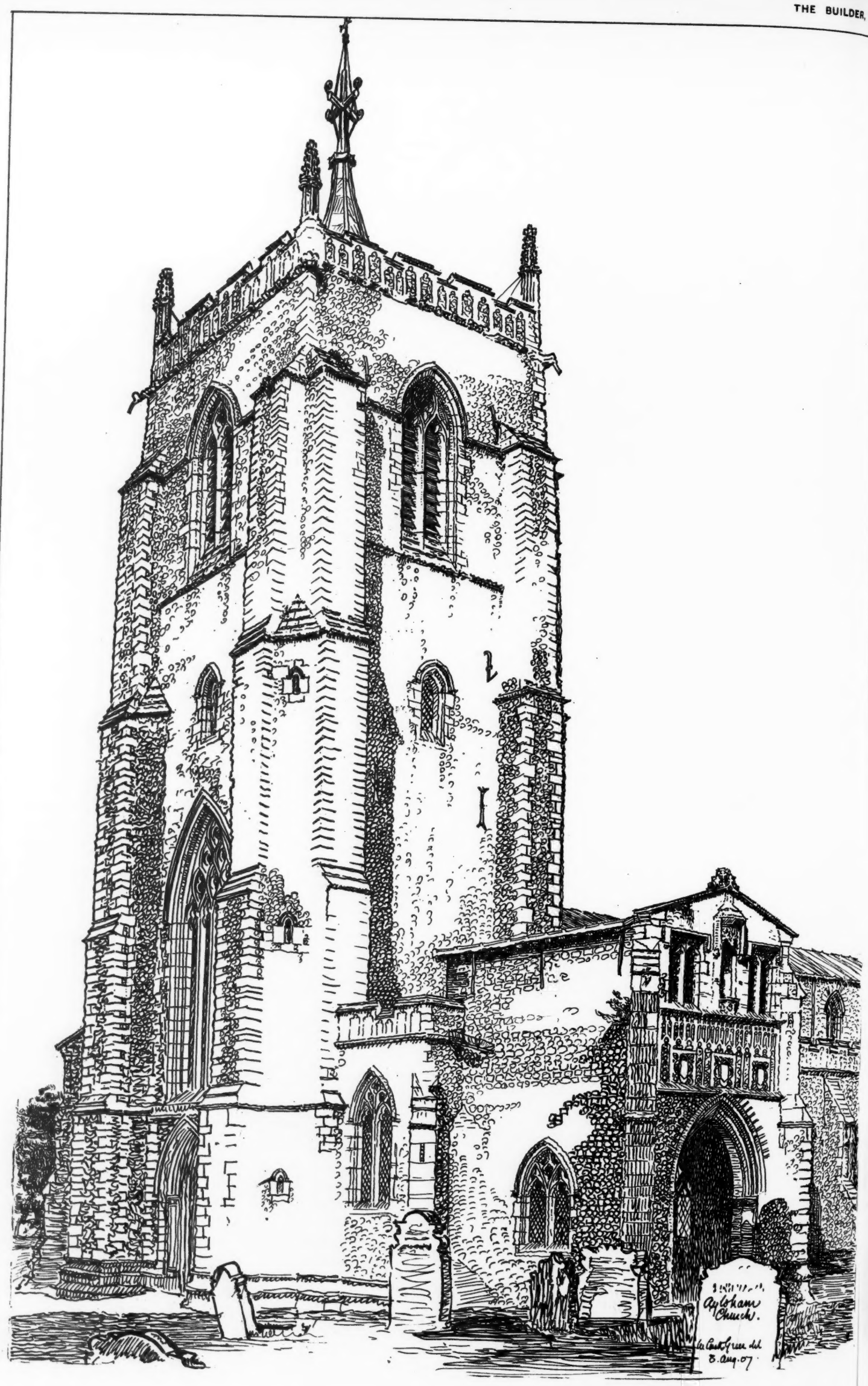
CO.

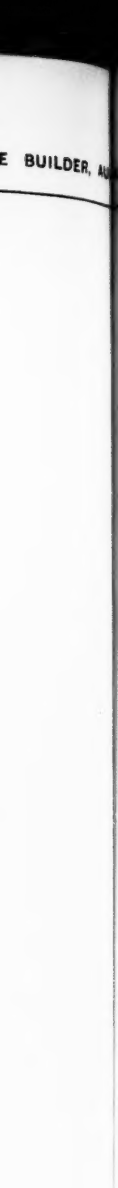
E.

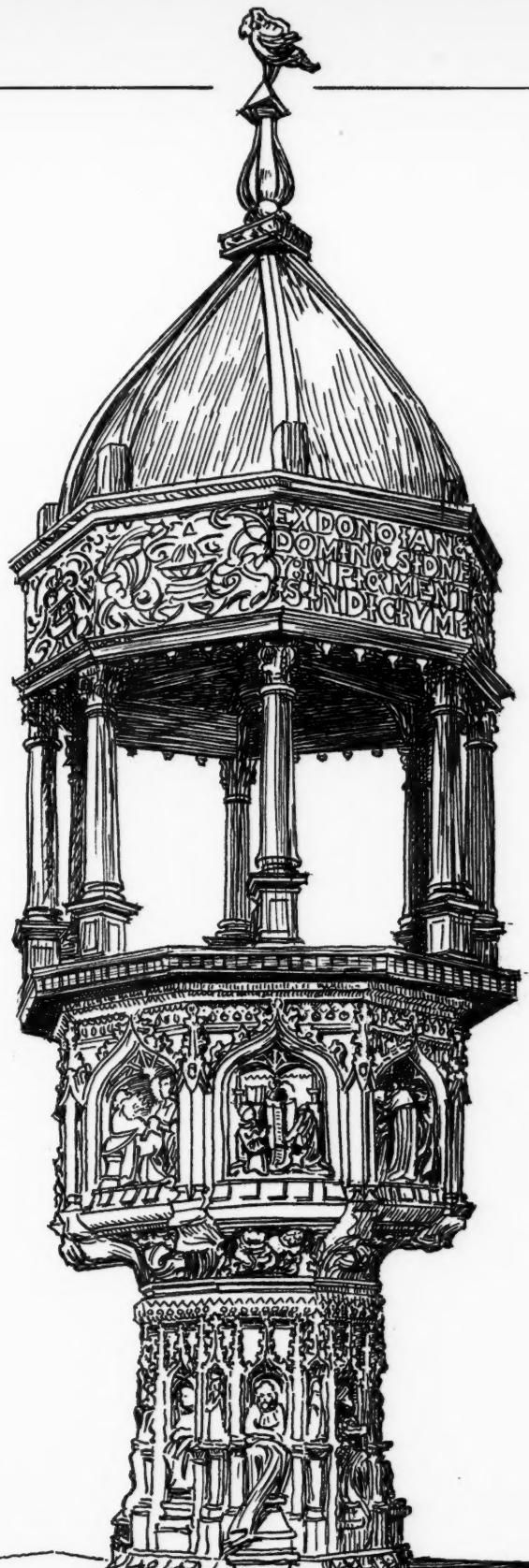
le.

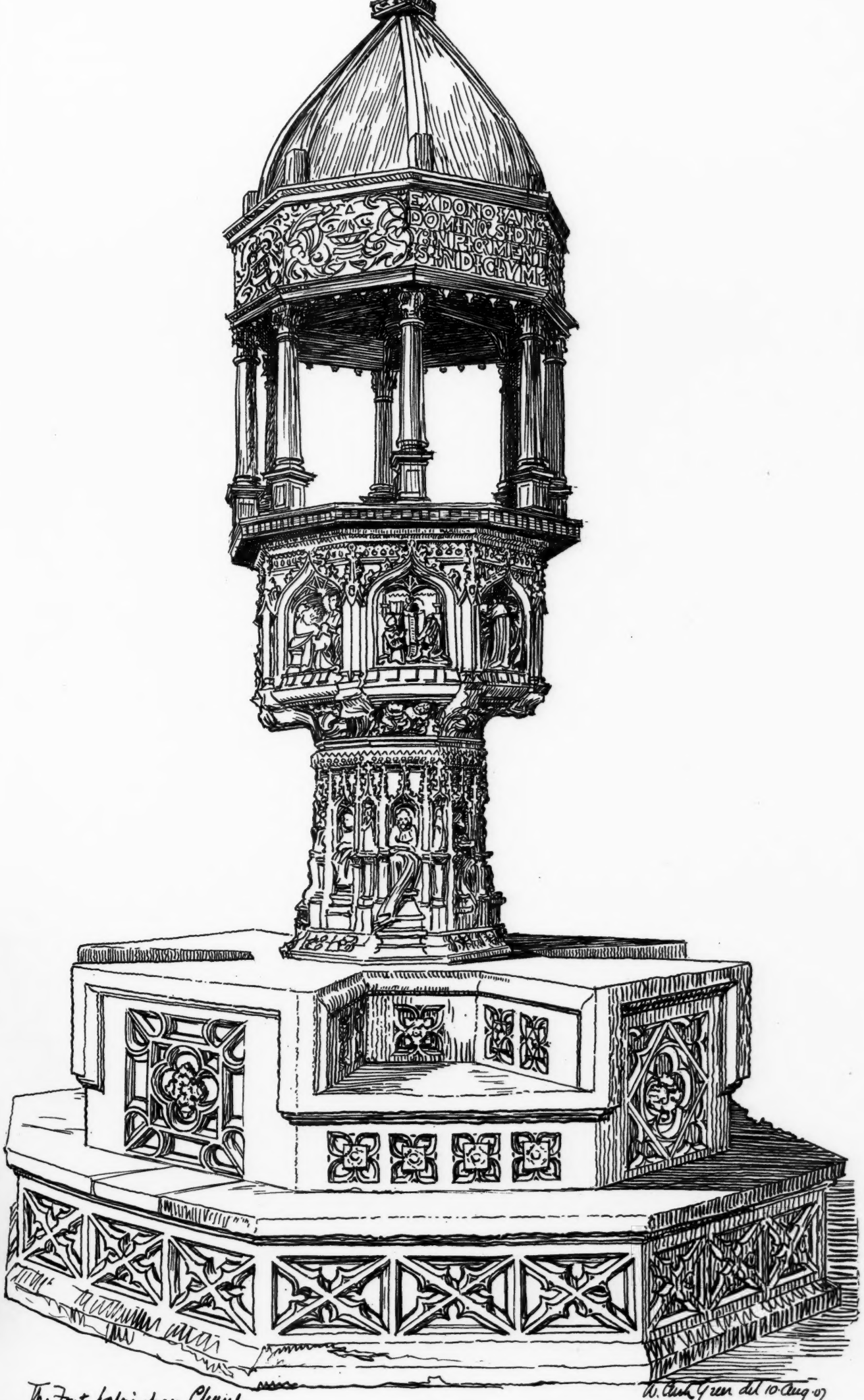
FING.

AVING.
lines


Aylsham Church.
E. Cautley Green del
8. Aug. 07



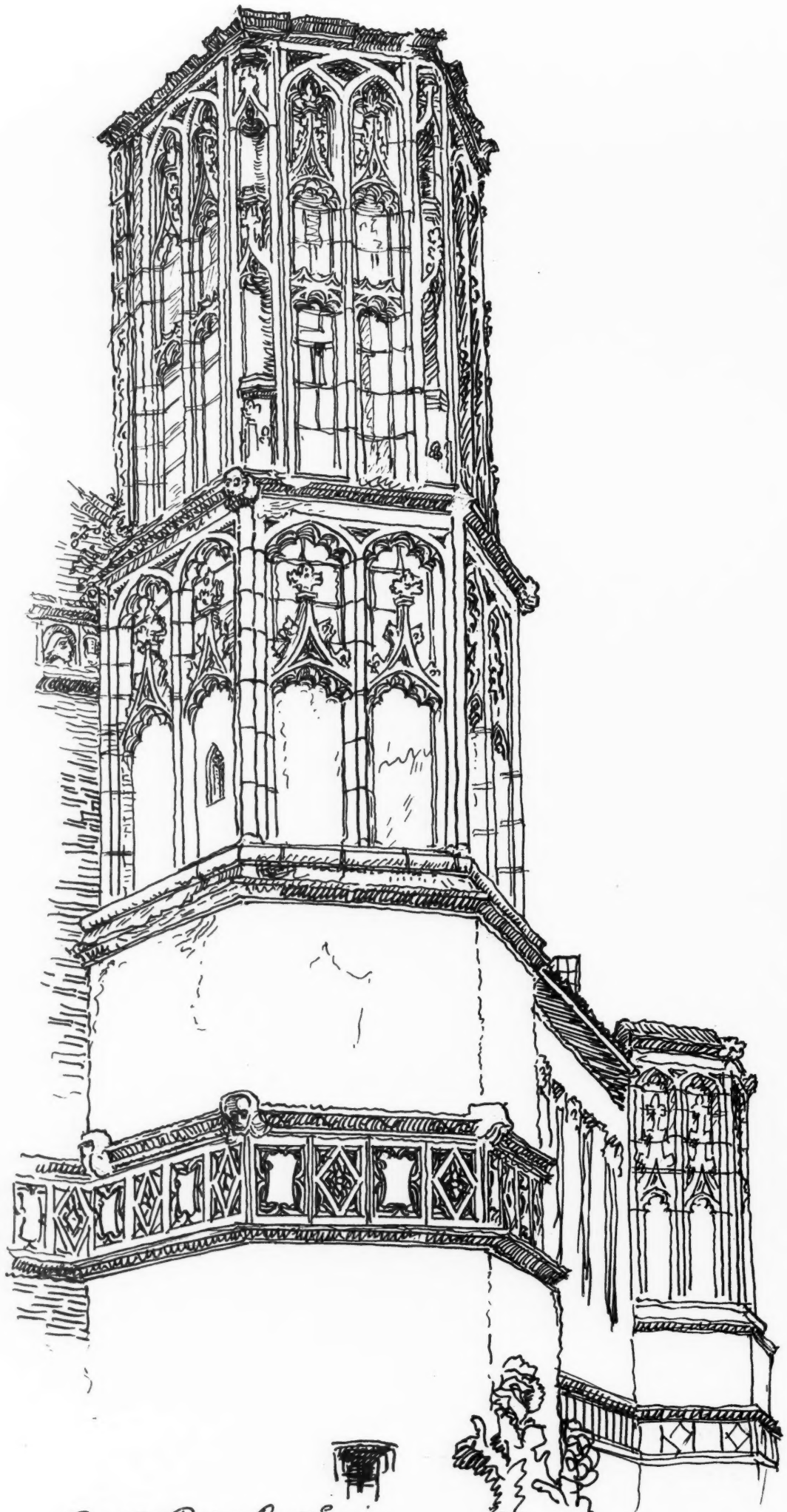




The Font Walsingham Church

W. Clark Green del 10 Aug 07

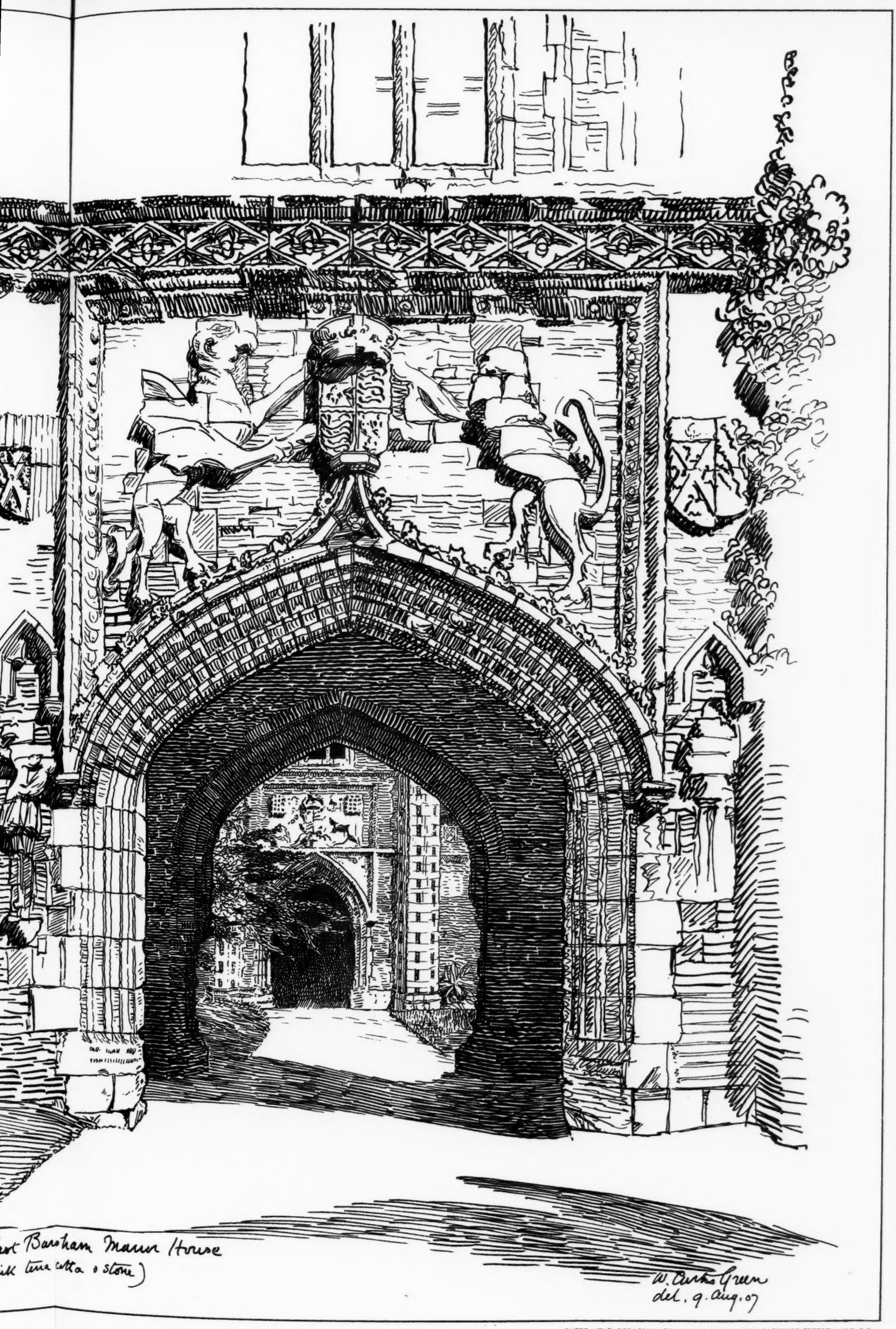
PHOTO-LITHO. SPRAGUE & Co Ltd 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



Part of the Rectory Great Snoring.
(in brick terra cotta & plaster.)

E.H. del. 9. Aug. 07

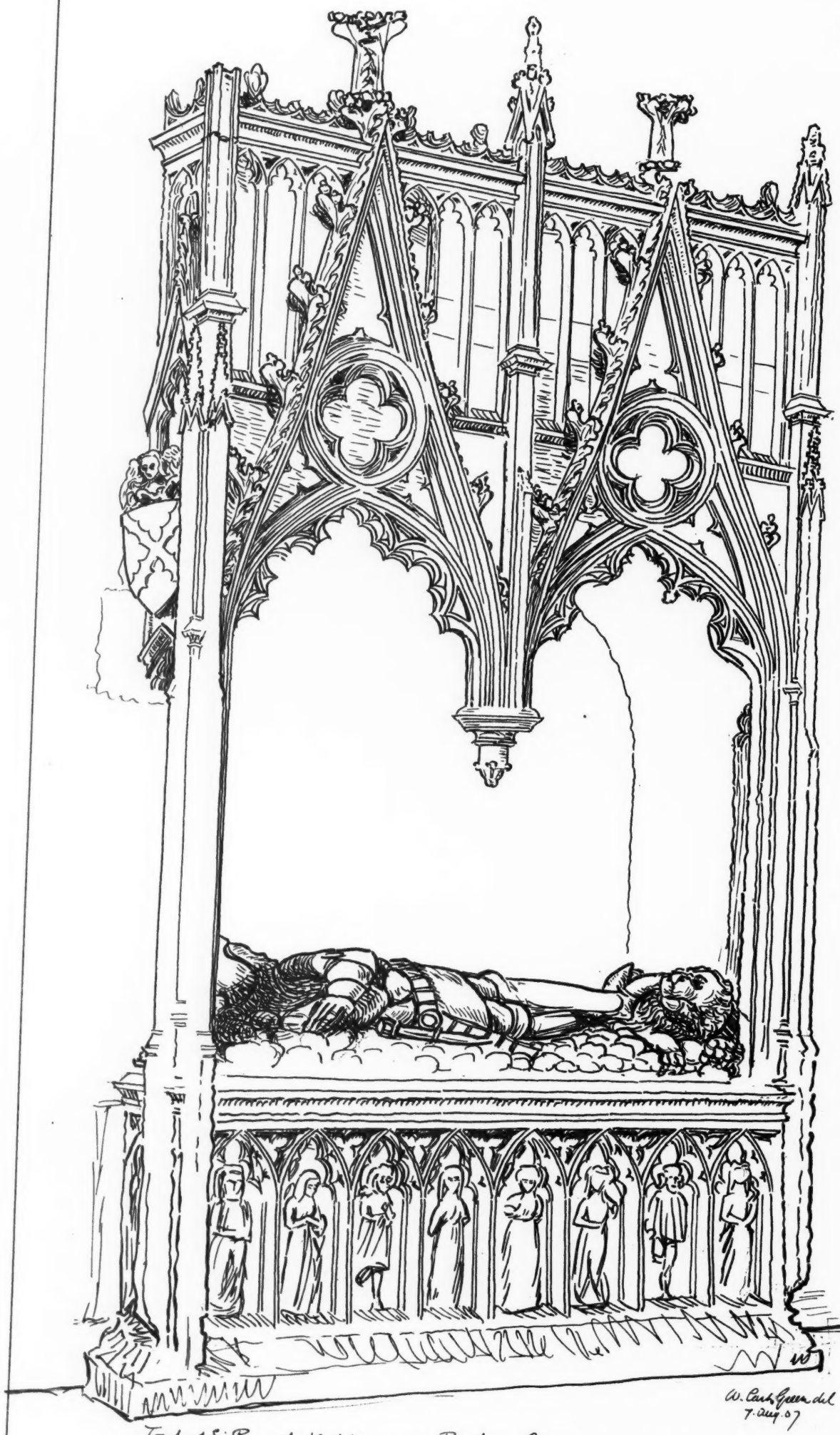
Part Barsham
(brick terra cotta &



rt Barsham Manor House
ick terra cotta & stone)

W. Curtis Green
del. 9. Aug. 07

PHOTO-LITHO. SPRAGUE & Co L.- 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



W. Cash Green del
7. Aug. 07

Tomb of Sir Roger de Kerdiston 1337. Reepham Church. (once coloured.)

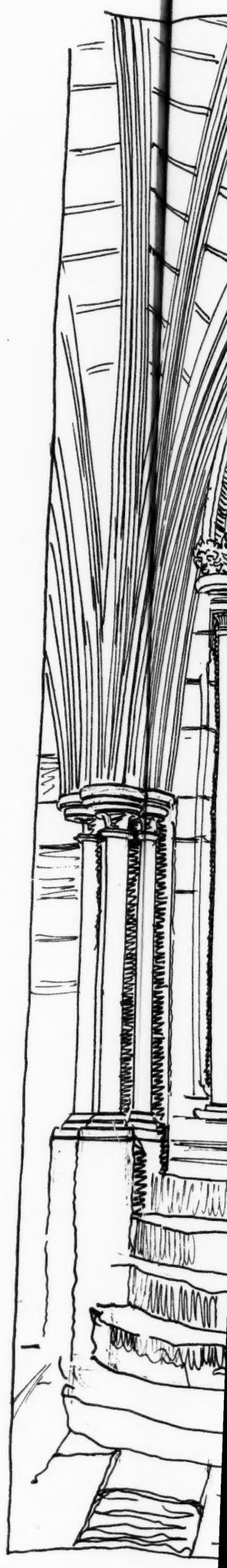
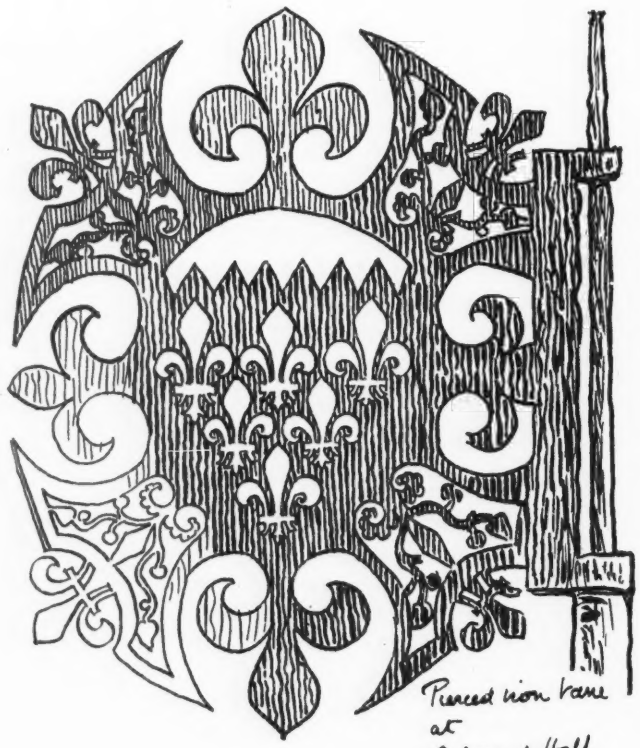


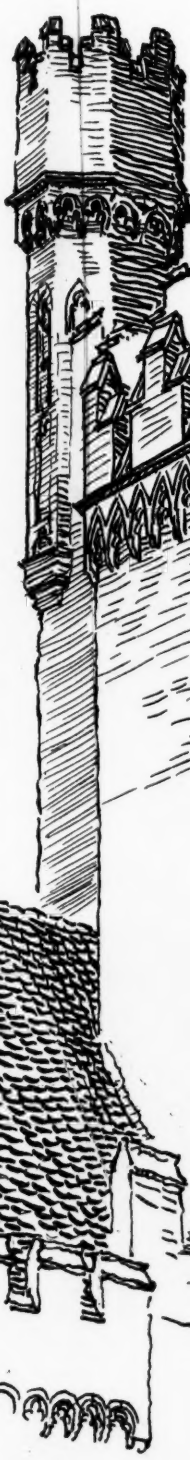
PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

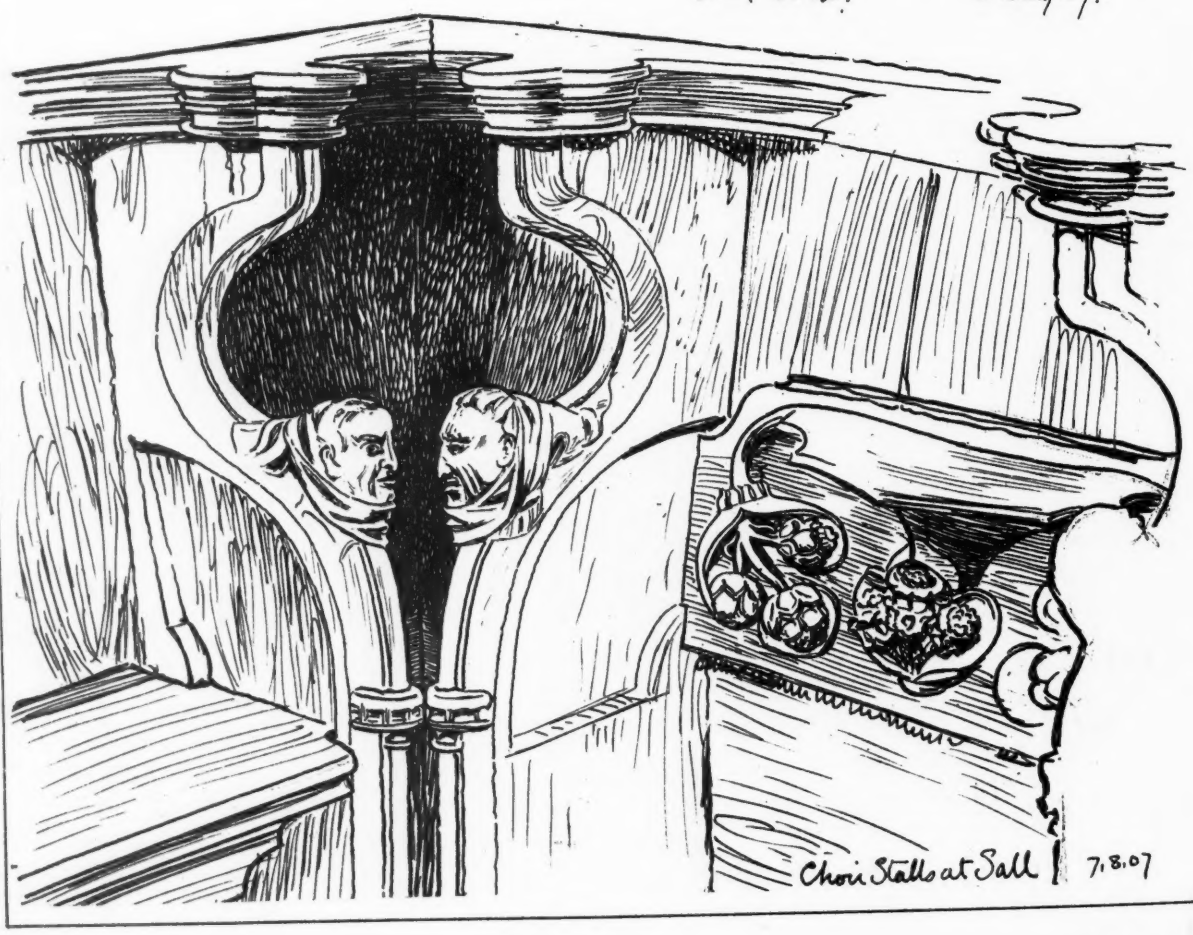
On the Close Norwich



Pierced iron vane at Oxborough Hall

Strangeolt Hall. Norwich. Carved & painted wood corbels. 5. Aug. 07.





Choir Stalls at Sall 7.8.07

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PROPO

PROPOSED : CANADIAN : OFFICES : STRAND : LONDON

A·MARSHALL·MACKENZIE & SON : ARCHITECTS
13 : WATERLOO : PLACE
LONDON : S.W.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.